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YEAR

CHEMICAL WEEKLY

VOL. XXXIII

FEBRUARY 9, 1988

NO. 22

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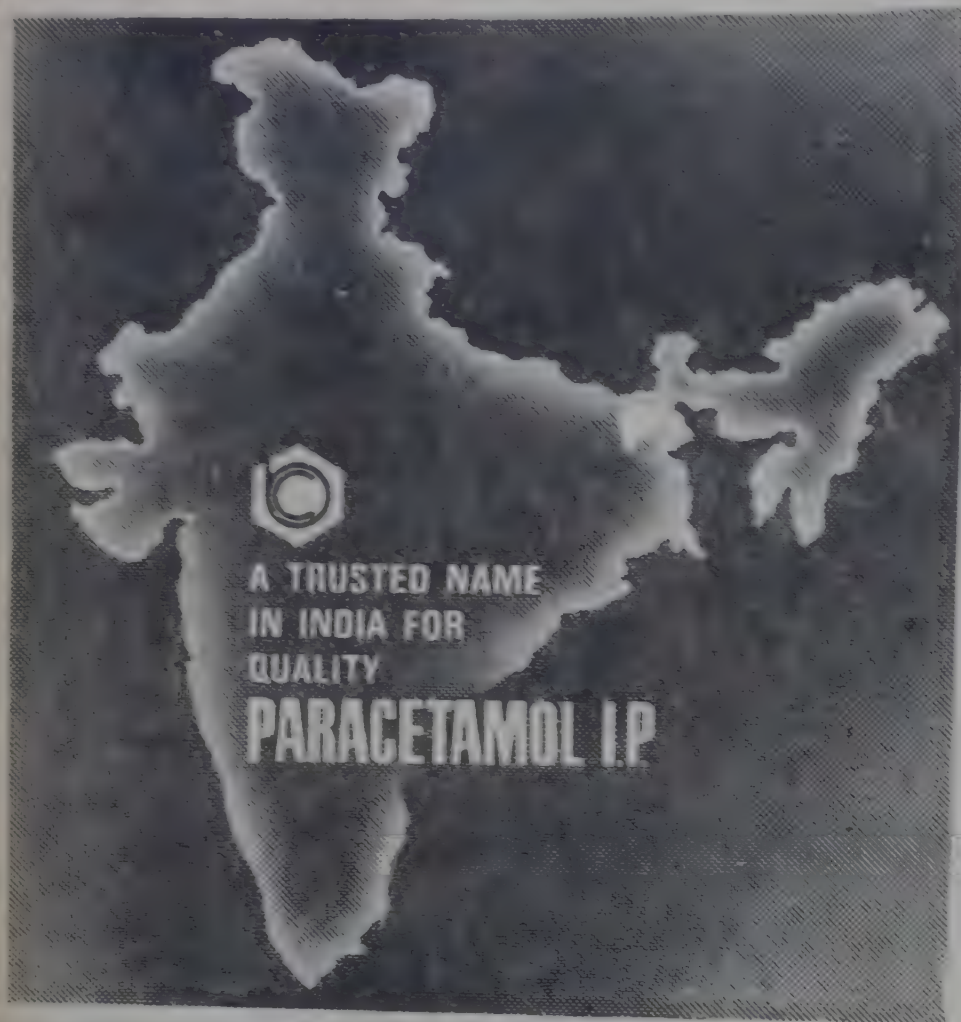
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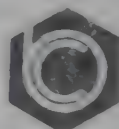
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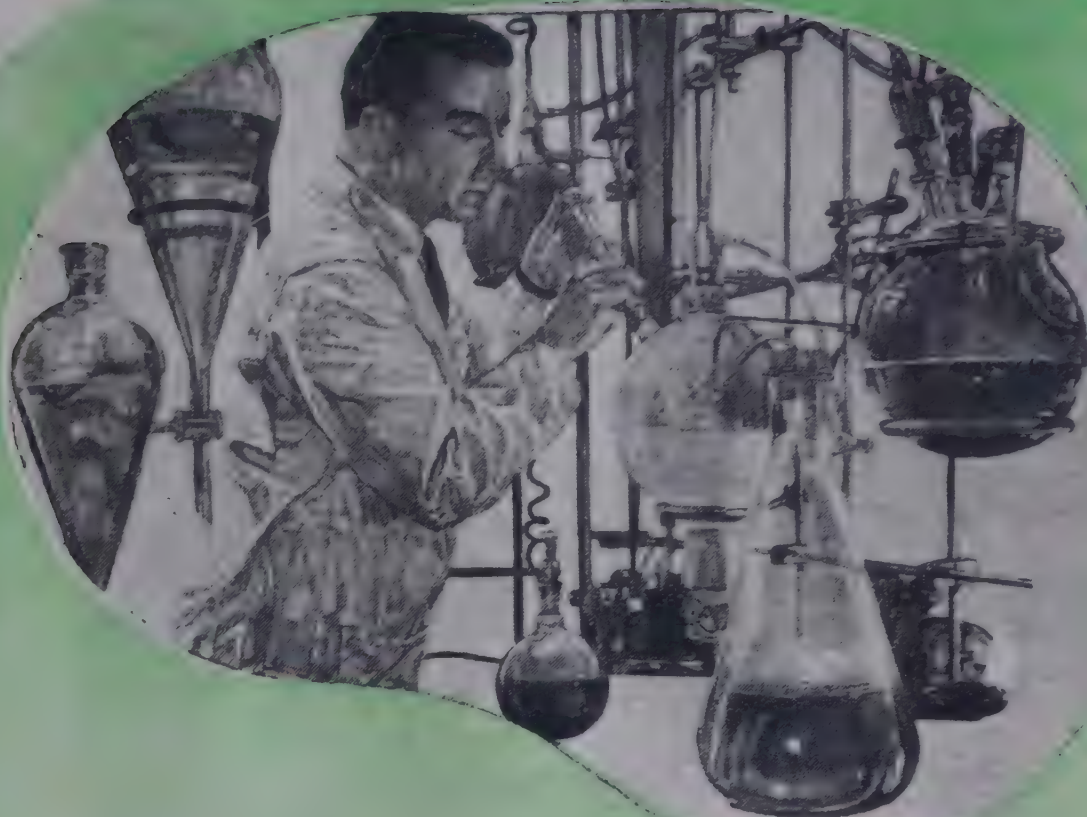
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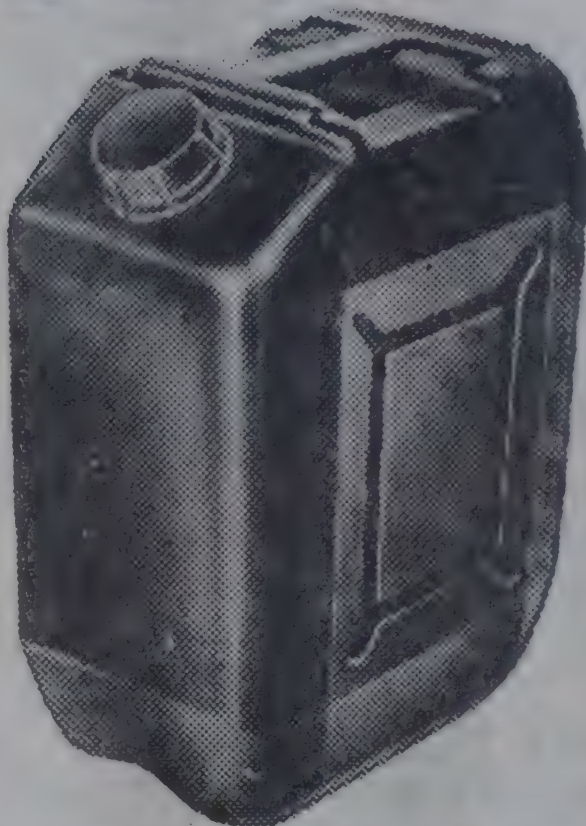
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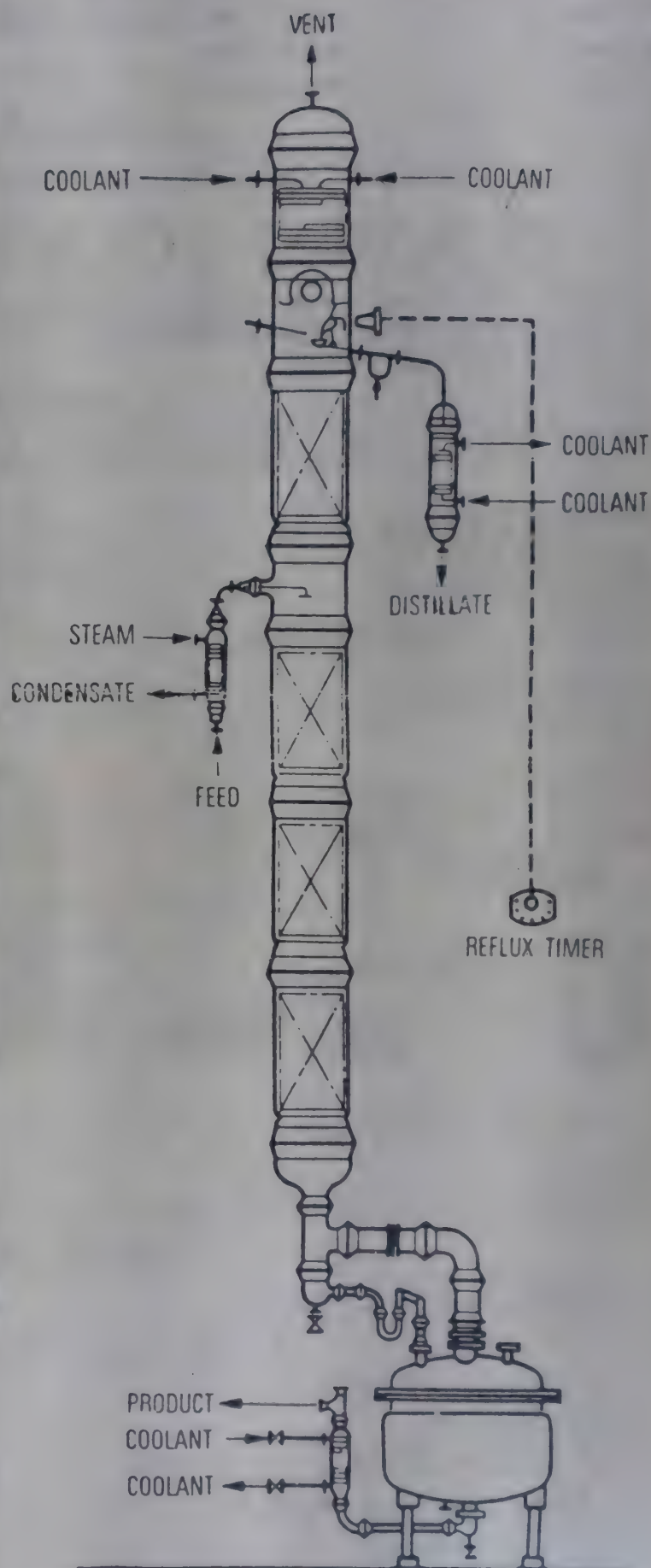
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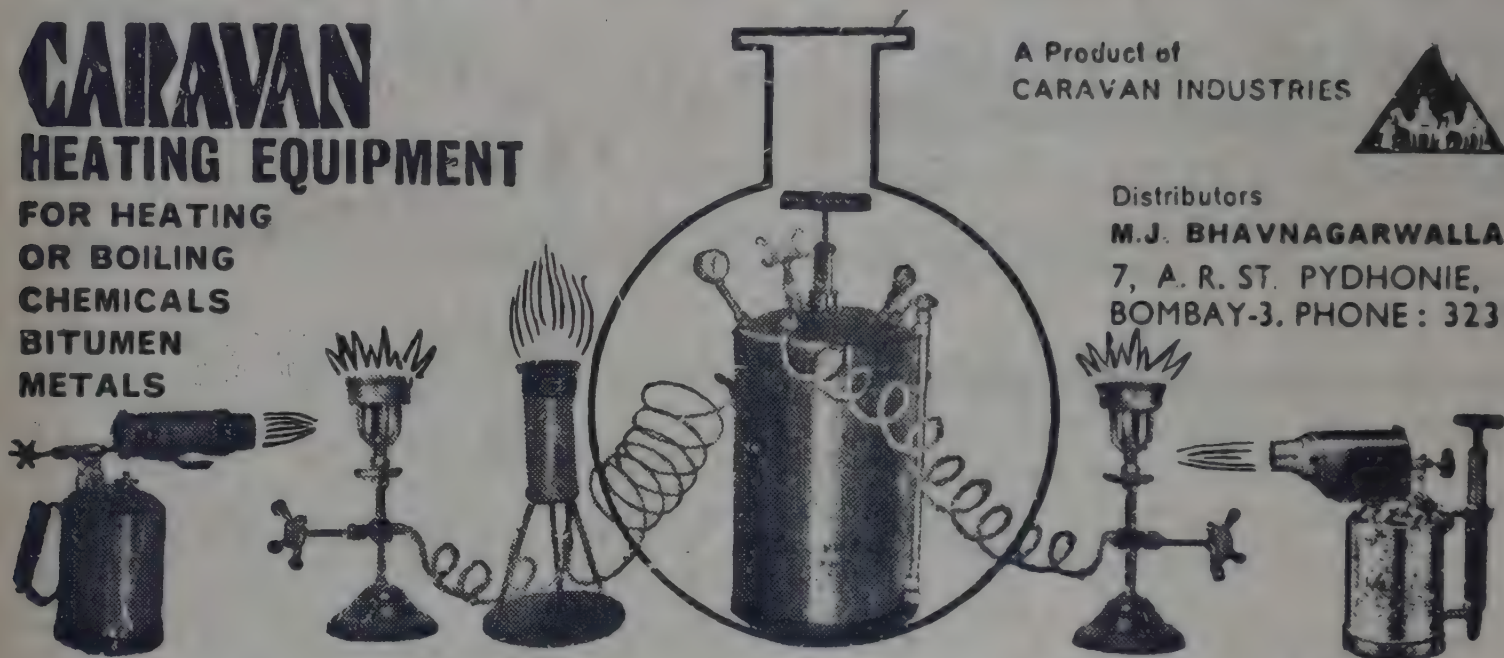
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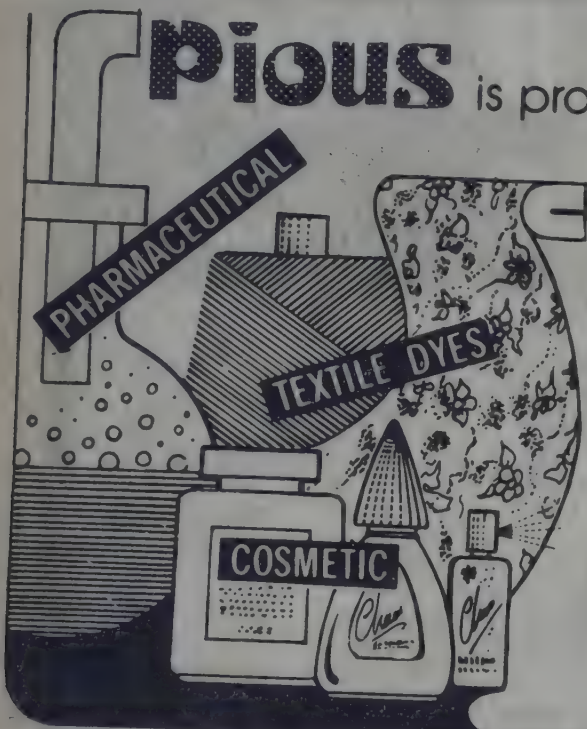
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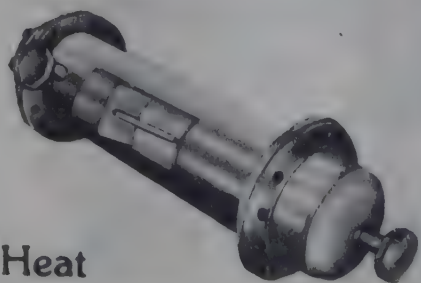


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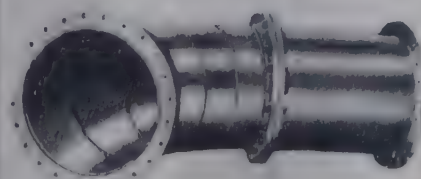
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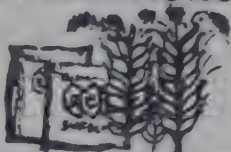
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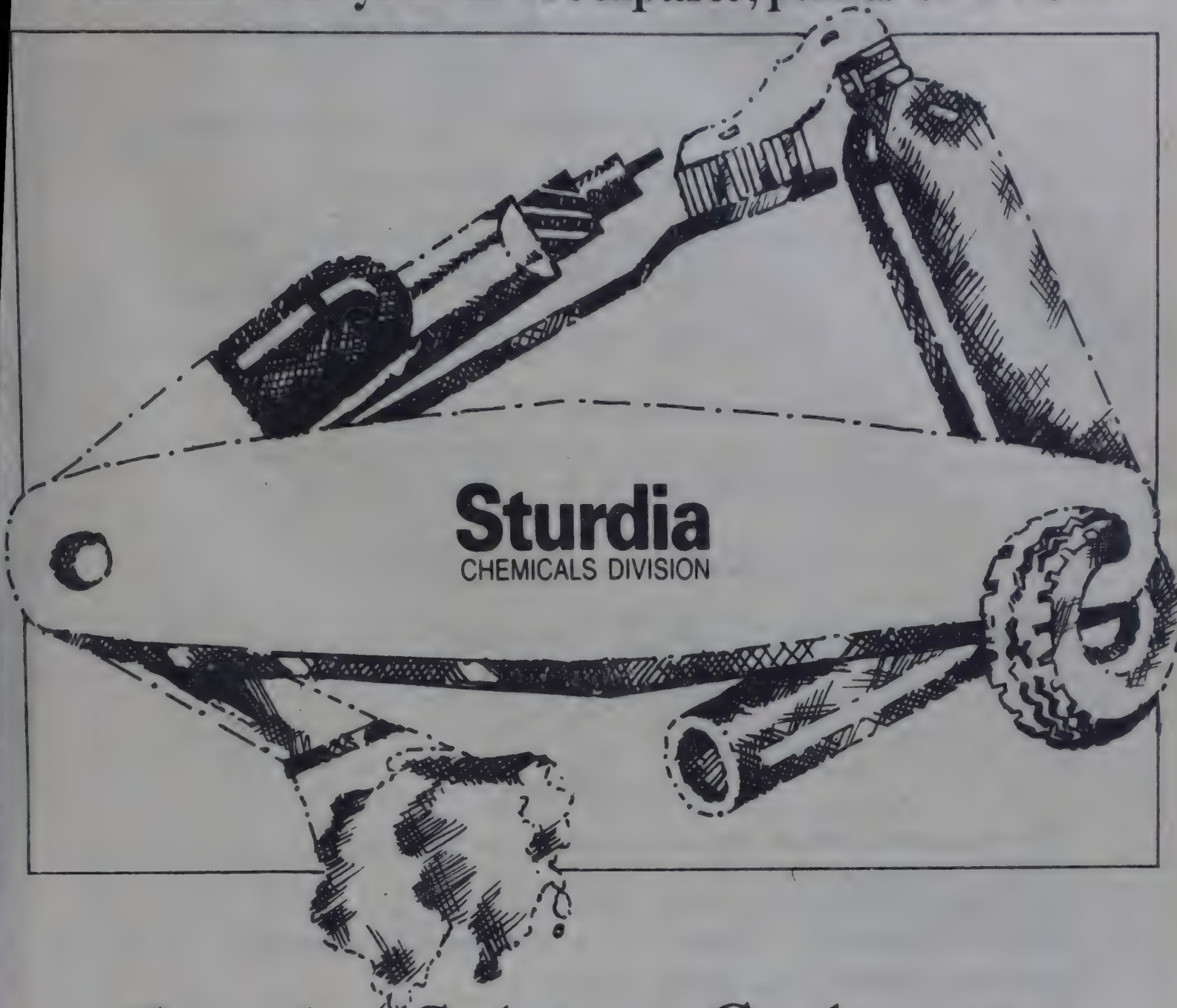
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NO. 22

The New Nuclear Nations

The continuing spread of nuclear weapons poses incalculable risks to the world community. The declared members of the nuclear weapons club are the United States, Soviet Union, Great Britain and France. Nevertheless, the number of countries able to manufacture nuclear weapons and apparently ready to do so in response to regional pressures has grown steadily. The Republic of China which detonated its first nuclear device in 1964 was the last country to join the so called nuclear club officially.

Israel probably achieved this status between 1968 and 1973. India exploded her first and only nuclear test in 1974, which no other nation besides the five declared nuclear powers have done. India has been firm in her declaration that hers was a "peaceful nuclear explosion". South Africa has become a defacto nuclear state in late 1970s. Pakistan stands on the threshold today. Argentina, Brazil, Iraq and Libya, although they lack the ability to manufacture nuclear explosives have all been very active in their pursuit to develop this capability.

It is the proud but still untested claim of the five declared nuclear powers, that relatively stable relations have been established between themselves and that it is the spread of nuclear arms to the new nuclear nations that presented a host of unparalleled, unpredictable dangers to humanity. With the spread of nuclear capabilities the threat of nuclear terrorism grows. Indeed in April 1985, US officials experienced a nightmare when an undetected individual contaminated a city's water supply with plutonium -- fortunately the level of contamination was too low to be dangerous. It is fully realised now that the gap between sensational fiction and reality is fast narrowing. Israel, Iraq and Iran have already carried out raids against foreign nuclear plants and allegations have been made about similar designs by Libya and even India.

Israel is the only state in the Middle East that is believed to possess nuclear arms and it is reported to have slowly expanded its arsenal to 20 to 25 aircraft

deliverable weapons. Western European nuclear suppliers have severely curtailed nuclear co-operation with Libya, Iraq and Iran reducing possible dangers from these states.

A netherworld of covert dealings in nuclear technologies and materials has existed since the dawn of the atomic age. It began in 1940s with Soviet atom bomb spies and continues today with nuclear blackmarketeers and conspiring generals. The activities of the nuclear netherworld reveal a frightening history of intrigues, duplicity and unprincipled profiteering. Clandestine activities are the order of the day. Pakistan is reported to be still purchasing through faceless intermediaries, commodities to further its nuclear weapons quest. Possibly North Korea is doing the same. Israel's entry into the nuclear world had its origin in smuggling nuclear materials from the US.

Today Pakistan stands on the threshold of becoming a nuclear weapon state and there are some observers who believe that Pakistan has already manufactured several nuclear weapons and their components.

Another disturbing report recently confirmed by the US State Department is that North Korea is building a sizeable indigenously designed research reactor while Japan unquestionably has the capacity to produce nuclear weapons and is developing sizeable processing and enrichment capabilities. The strong domestic opposition to nuclear weapons arising from its history as the world's first nuclear victim excludes any threat of proliferation from this source.

China, which has been a declared nuclear power since 1964, does not want to oppose the spread of such weapons as a means of diminishing the power of USA and USSR in this area.

Indira Gandhi was candid in her commitment to the peaceful uses of nuclear energy. Rajiv Gandhi's assertions in 1985 to respond with defiant assertiveness to

each new development in Pakistan is viewed with increasing concern in the international forum.

Pakistani developments are under close scrutiny. One dominant impression is that it has mastered the technology essential for manufacturing nuclear arms, it does not yet have enough nuclear grade material. In 1984 reliable sources indicated that China has provided Pakistan with nuclear weapon design. The US law authorising aid package to Pakistan due to conclude in 1987 specified that the aid would be terminated in case Pakistan detonated any nuclear device.

But this provision is not a major deterrent. The Middle Eastern nuclear tension have increased sharply in the recent months. Israel has openly vowed that it could destroy Iraq's research reactor area again as it did in 1987. Iraq has launched two air attacks on Iran's partly completed nuclear power stations. Libya is busy developing the concept of joint front with Iraq and Pakistan collaborators.

Syrian nuclear capability remains extremely rudimentary but the Syrian Defence Minister has asserted that if Israel employed nuclear weapons against Syria, the Soviet Union would make nuclear weapons available to Syria.

The Western nations are projecting a horrendous image of a nuclear armed General Gaddafi of Libya, contemptuous of world opinion and the value of human lives as a symbol of the dangers of unrestrained nuclear proliferation.

Besides Iraq and Pakistan, Libya has a long standing nuclear relationship with Argentina. Iraq's nuclear programme has been dormant since the Israeli raid in 1987.

The establishment of a Contra Government in Brazil and the Argentine President's assertion that the two countries would permit reciprocal inspection offer hope of reduction in nuclear threat in Latin America.

The only African nation posing a significant nuclear threat is South Africa, whose ability to produce nuclear arms and interest in acquiring them, clandestinely and with Israeli collaborators has been confirmed beyond a reasonable doubt. Its nuclear arsenal may be in excess of 10 to 15 atomic weapons.

Perhaps it is only Australia and New Zealand in the South Pacific who appear to be free from nuclear threat.

The publication "The New Nuclear Nations" (Vintage Book, Random House, New York) is the Carnegie's Endowments Second Annual report on the spread of the nuclear weapons.

This volume describes in graphic detail the successful Pakistani efforts to smuggle nuclear plant design data from Holland and sophisticated control equipment from the USA imported as mountaineering equipment. Developments in Israel often read like fiction. At the conclusion of each chapter the readily available data on the nuclear capabilities and delivering competence about each nation is summarised.

This book presents a highly readable and realistic picture of the growth of nuclear science among the new nuclear nations and the effect as an unlikely deterrent on the big powers and the incalculable risks faced by the world community today due to probable indiscriminate act by one reckless and capricious politician in any state.

-- T.P.S. RAJAN

CHEMARENA

L. VENKITESWARAN

Microbes-based Pesticides

The use of microbes to provide useful chemical metabolites to counter human diseases -- penicillins, tetracyclines, rifampycin and many other antibiotics -- is well known and constitutes the largest sector of pharmaceuticals. However, a similar line of development of microbe-based products to counter the problems of pests of plants and plant materials has made little headway in spite of some early promise. The potential for development of natural pest and weed control systems is great but yet to be harvested. Abbott Laboratories of USA hit the headlines two decades back with a product derived from *Bacillus Thuringiensis* but since then there is very little to note, though a long list of microbes of promise have been reported -- see Table I (From *Farm Chemicals*, Sep. 1986).

One of the reasons cited is the limited shelf life of the products and problems of using them in ways similar to the chemical pesticides. The product is often not stable long enough on the soil to be effective. Viruses are pos-

sible candidates for development but very few show potential. The danger to animal life is a threat that has to be totally absent. But some agrochemical companies are investing in the technology of biological control with Integrated Pest Management.

Genetic engineering promises to generate more pest pathogens but translation into production plants is beset with special problems. Regulation issues relating to introducing novel microbes into the environment have held up development to some extent. Patent protection for a living organism is possible only for specific applications or specific techniques of production. All the same microbes as source of pesticides is an area for the future and agrobiologicals cost less in development costs --see Table II. (From *Farm Chemicals*, Sep. 86).

There is also the possibility of chemical modification or synthesis of better products originally derived from microbes.

Table I
CANDIDATE MICROORGANISMS FOR PESTICIDES

Microorganism Type	Target	Development Stage & Trade Name
BACTERIA	Insects	
B. Papillal/Lentimorbus	Japanese Beetle	Commercial: DCOM
B. Sphericus	Mosquito	Field Trials
B. Thuringensis		
B. Serotype 1	Flies	Commercial: Muscabar
B. Serotype 3a, 3b, HDI	Caterpillars	Commercial: Biobit, Bactospeine, Dipel, Thuricide
B. Serotype 3a, 3b, NRD12	Caterpillars	Commercial: Javelin
B. Serotype 7	Waxmoth	Commercial: Certan
B. Serotype 14	Mosquito	Commercial: Bactimol and others
	Diseases	
Agrobacterium Radiobactor	Crown gall	Commercial: Galltrol
B. Subtilis	Seedling root diseases	Commercial: Quantum 4000
FUNGI	Insects	
Beauveria Sp.	Colorado Potato beetle	Commercial: Galltrol
Hirsotolis Sp.	Citrus rust mate	Commercial: Mycar
Verticellium Sp.	Aphids	Commercial: Vertalec

Microorganism Type	Target	Development Stage & Trade Name
Trichoderma	Diseases Plum silver leaf	Commercial: Binab
Collectotrichium Sp.	Weeds Northern joint Vetch	Commercial: Collego
Phytophthora Palmivora	Milkweed vine	Commercial: Devine
VIRUS	Insects	
Cydia (GC)	Codling moth	Commercial: Decyde
Heliothis (NPV)	Cotton Caterpillars	Commercial: Elcar
Hymantrie (NPV)	Gypsymoth	Commercial: Gypchek
Mamestra (NPV)	Caterpillars	Field Trials
Neodipmon (NPV)	Pine Saw Fly	Commercial: Virox
Spodoptera (NPV)	Caterpillars	Field Trials
PROTOZOA		
Nosema Lowstar	Grasshoppers	Commercial: Nalox
NEMATODES		
Heteorhabditis	Black vine weevil	Commercial:
Steinernema	Soil pests	Commercial: SEEK
	Termites	Commercial: Spear

Table II

A COMPARISON OF COST OF DEVELOPING CHEMICAL AND BIOLOGICAL PESTICIDES

	AGROCHEMICALS	AGROBIOLOGICALS
PRODUCT DEVELOPMENT		
New product discovery	Screen 15,000 compounds, discover afterwards what targets they control	Target selected on market need; microbial control agents often easy to find
R & D costs	£12 million	£400,000
Market size required for profit	£30 million per year to recoup investment; limited to major crops	Markets under £600,000 can be profitable due to low development cost
Patentability of product	Well established	Recent precedents are encouraging
PRODUCT USE		
Kill	Often 100%	Usually 90-95%
Speed	Usually rapid	Can be slow
Spectrum	Generally broad	Generally narrow
Resistance	Often develops	None yet shown, but microbes also adaptable
PRODUCT SAFETY		
Toxicological testing	Lengthy and costly £ 3 million	£40,000
Environmental hazard	Many well known examples	None yet shown
Residues	Interval to harvest usually required	Crop may be harvested immediately

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Dimethyl Formamide

Dimethyl Sulphoxide

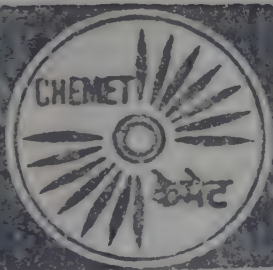
Pivaloyl Chloride

2 Ethyl Hexanoic Acid

Sodium 2 Ethyl Hexanoic Acid

n-Butanol

Methyl/Ethyl Aceto Acetate



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Plea for alcohol monitoring body

Alcohol-based industries have suggested that a National Alcohol Authority (NAA) be set up to ensure effective implementation of the policy guidelines and decisions of the government and to monitor the functioning of the alcohol based units for their sound growth.

This body may replace the Central Molasses Board, which is only an advisory body. The new body can be empowered with adequate authority to control and regulate distribution, allocation and movement of molasses and alcohol. This body should also have authority to bring about uniformity in state levies and duties of molasses and alcohol, vital industrial feedstocks. The suggestion deserves careful consideration by the authorities.

According to the All India Alcohol-Based Industries Development Association, the existing molasses-alcohol policy is conducive to the even growth of alcohol based industries in the country. AABIDA has observed that the present price of Rs. 120 per tonne fixed for molasses is on the high side, even though the government has softened the rigours of the price hike by granting a rebate of central excise duty. Nevertheless, it has pleaded for continued price control on molasses, which is only a by-product. The prices of industrial feedstocks like molasses and alcohol will have to be necessarily controlled, keeping the national imperatives in mind.

The association has welcomed the present policy of setting up medium-sized alcohol based units widely dispersed over the country. With a moderate investment of a few crores such units will prove useful it is felt. It feels that there is no justification for putting up methanol-based acetic acid plants in the country which will involve huge investments. The country's requirements of acetic acid can be met effectively and easily by the existing units and by their planned expansion.

AABIDA has opposed the import of organic chemicals under OGL. The imports permitted to actual users on a selective basis also need to be reviewed. It has pleaded for the removal of inter-state restrictions on movement of molasses and alcohol as also scrapping

of export and import fees being imposed by the state governments. It feels that all state levies on industrial alcohol should be done away with as these affect the offtake of alcohol for industrial purposes. Also, the tendency to divert more alcohol for potable purposes should be discouraged.

By the end of the Seventh Plan, the country is expected to produce 100 lakh tonnes of sugar, 45 lakh tonnes of molasses and 1,000 million litres of alcohol. This quantity of alcohol can be absorbed only if alcohol-based industries are developed on sound lines.

RESTRICTION ON ALCOHOL FROM SOURCES OTHER THAN MOLASSES SOON

The Union Government is likely to impose some quantitative restriction on the additional capacities, which will be allowed to be created in the potable alcohol sector based on raw materials other than molasses.

The non-molasses raw materials, using which units could produce potable alcohol, are also likely to be listed by the Government. Preliminary discussions within the Government have shown that raw materials like tapioca, mahuwa, culled fruits and spoiled wheat could be allowed to be used for producing potable alcohol.

The guidelines for allowing creation of fresh capacity in the potable alcohol sector is expected to be finalised in another few weeks. An official committee is currently seized of the matter. Several rounds of discussion with the State Govt. representatives have been concluded and a final view on the guidelines is being taken by the committee, before these are announced.

The committee was set up by the Department of Chemicals and Petrochemicals after the Government announced its liberalised policy on molasses and potable alcohol industry in September last year. The liberalised policy had relaxed the ban on creation of additional capacity in the potable alcohol sector provided it uses non-molasses raw materials.

The policy had, however, insisted that the alcohol industry would continue to be a specially regulated industry under Schedule IV of the Industries Development and Regulation Act

(IDR) both for purposes of setting new units or for expanding existing capacities. It was stipulated that while considering creation of additional capacity using non-molasses raw material it would be ensured that only those raw materials which are not otherwise usable are allowed to be used for producing potable alcohol.

Subsequent to the policy liberalisation, it was generally believed that there would be no restriction on creation of additional capacity in the potable alcohol sector, if the alcohol is produced using non-molasses raw materials. The committee has, however, felt that a quantitative limit should be imposed on the increase in the capacity to be allowed under the liberalised policy.

According to official sources, several units both existing and new ones are interested in producing potable alcohol using raw materials other than molasses. The State Governments are also encouraging units to take up production of potable alcohol, which besides earning excise revenue for the States will help meet the gap in demand and supply.

The unmet demand for potable alcohol is quite substantial in the country. This is primarily attributed to a Government decision to freeze capacity creation in the potable alcohol sector from November 1975. The capacity freeze applied to all distillation or brewing of alcoholic drinks, except in the case of 100 per cent export-oriented ventures. Since then, no new licence has been granted except for granting 62 carry-on-business licences for units, which were either in production or had taken effective steps for production of potable alcohol prior to November 1975.

The capacity freeze was imposed as steps had to be taken to ensure that adequate industrial alcohol should be made available for use in the chemical industries. The step was thus introduced to stop diversion of molasses to the potable alcohol sector. The temptation for such diversion was both for the States for excise revenue and for the units for earning more profit.

The guidelines, which are now being formulated, will thus indicate permissible levels of capacity like as also the non-molasses raw materials, which could be used for production of potable alcohol.



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FUEL ALCOHOL

Canadian firm offers know-how

A Canadian company is willing to transfer its proven technology for production of fuel alcohol and high protein-rich food products using wheat as raw material through a single process.

North West Food and Fuel Corporation based at Saskatchewan is on the look out for collaborators to put up plants. Some leading industrial groups in Madras and Bombay have already shown interest.

Speaking to newsmen in Madras on Feb. 1, Mr. Jim Clegg, President of the company and its Business Manager and Secretary, Mr. G. V. Shankar, said that they would soon discuss with CFTRI officials, Bangalore and the Union Government for transferring the unique technology.

A plant with a capacity to produce 3.5 million litres of fuel alcohol consuming 7,000 tonnes of wheat a year would cost about 2.5 million Canadian dollars. The size can go up to 120 million litres depending on the demand for the fuel.

The company has successfully proved the efficacy of the technology by establishing a plant at Kerrobert. Two more companies have set up similar plants.

The spokesman said that NWF & F was keen to share its expertise with the developing countries as they attached importance to alternative sources of energy and produced more grains.

India is the first country they are visiting with a hope to get Government support. The venture would be highly successful and cost effective in India as all equipment could be procured indigenously and the raw material was also cheaper.

A complete package would be offered to the collaborators with an option to produce alcohol alone or both the fuel and value-added food products.

In addition, a co-generation plant could be put up using ethanol. Mr. Shankar indicated that assistance would also be coming from Canadian agencies.

Explaining some special features of Kerrobert technology, he said it ensured

ed increased fermentation yield, low fermentation time, unique separation of bran and starch from the grain, efficiency in parallel production of food grade alcohol and vinegar.

In the beginning, the company would promote a pilot plant (capacity 3.5 million litres) on its own with Canadian support. While its main raw material was only wheat, others like rice, corn, maize could also be used in future if their supply improved.

Mr. Shankar and Mr. Jim said that ethanol extracted from the plant was also now used as an alternate fuel in commercial vehicles. They expected some incentives in the form of subsidy from the Indian Government for such ventures so that the farmers would benefit and the fuel would cost less.

Besides the fuel technology, NWF & F could make available advanced Canadian technologies to Indian entrepreneurs through licensing agreements in the fields of agriculture, pharmaceuticals, chemicals, automation, electronics, communication, power transmission, corrosion resistance etc.

It was successfully negotiating contracts with leading Indian companies on behalf of those based at Saskatchewan and Ontario. Shortly some tie-ups would be clinched. NWF & F was also looking for partners in the field of trading.

MAHARASHTRA CUTS INDUSTRIAL ALCOHOL PRICE

The Maharashtra government has reduced the price of industrial alcohol to Rs. 2.85 per litre, from Rs. 3 per litre, as the state has a glut of it.

The glut began with the commencement of the sugar season in November last. Sugar crushing is in full swing in most of the sugar mills in the state, industry sources said.

Another factor for the price cut is the closure of Union Carbide plant in Bombay, a major consumer of alcohol in the state.

The alcohol price in the state, however, is still higher, compared to the prices in neighbouring states, as there is an export pass fee of Rs. 1.25 per litre and a local tax of Rs. 0.75 per litre in Maharashtra.

The sources said that a reduction in the export pass fee and other local levies would result in the lifting of alcohol produced in the state by chemical units of other states. This would ease the glut situation in the state, it said.

Meanwhile, the distilleries in Maharashtra are yet to effect the export of 200 lakh litres of alcohol, as the international price for alcohol is not attractive enough. The govt. had permitted the export of 200 lakh litres of alcohol from Maharashtra and another 500 lakh litres from Uttar Pradesh a few weeks ago.

PLASTIC UNITS PLEA FOR IMPORT DUTY RECAST

Organisation of Plastics Processors of India (OPPI) has submitted a detailed memorandum to the Union Government recommending a suitable restructuring of the import duty so that the varied and vital sectors of the economy are not affected by a shortage which can assume alarming proportions.

According to the organisation, the plastics processing industry is facing its worst-ever problem of a domestic shortage compounded by an increase of over 100 per cent in international prices of commodity plastics like LDPE, HDPE, PP, PVC and PS.

On the world scene, prices of commodity plastics have doubled in the past 12 months due to a bottleneck in the basic feedstock, ethylene capacity, which would continue through 1988 and 1989.

The rationalisation of the import duty on several commodity plastics introduced in September 1987 was made ineffective by relentless rise in international prices and as a result, the landed cost of imports of plastics raw materials was 20-35 per cent higher than the corresponding domestic prices.

The organisation felt that such disparity must be corrected through rationalisation of import duty structure as the industry needed to import about 297,000 tonnes of plastics in 1988-89 to sustain growth.

The demand for plastics has been growing at the compound annual rate of around 12 per cent per year. However, the per capita consumption remains at a low of 0.7 kg as compared to three kg. in China and over 40 kg. in European countries.

BP may seek partner for acetic acid from methanol

British Petroleum is awaiting a Government decision on new capacities for the manufacture of acetic acid from methanol, before choosing an Indian partner.

The Government has granted letters of intent to two parties, Gujarat Narmada Fertiliser Company Ltd. (GNFC) and Rama Petrochemicals Ltd., to produce 25,000 TPA each of acetic acid through the methanol route. GNFC is understood to have approached the Government for enhancement of its capacity.

According to unconfirmed reports, Reliance Industries Ltd. (RIL) has submitted an application for setting up a 10,000 TPA plant. The plant of RIL is expected to become the single largest consumer of acetic acid in the new year. Its acetic acid consumption is estimated around 10,000 tonnes.

Even the enhanced capacities sought are small by international standards. This, according to industry sources, explains the wait-and-watch policy adopted by British Petroleum, who have purchased technology rights for the process from Monsanto, the American chemical giant, and are now being courted by prospective Indian manufacturers.

In India, acetic acid is produced exclusively from industrial alcohol by acetaldehyde route. It is the only country to follow this route. Elsewhere, it is produced from methanol, through a process developed by BASF and Monsanto.

This route has been favoured in the West because of favourable raw material supply. Another process, based on the same feedstock, is direct oxidation of n-butane. This process is followed by Celanese and Union Carbide in the US and Akzo in the Netherlands.

The average annual capacity of acetic acid plants abroad is around one lakh tonnes. The following are the capacity figures (in tonnes) of world's leading acetic acid producers: Celanese, US 2,63,000. Akzo Chemie, the Netherlands, 2,95,000. Monsanto, US 1,80,000. Kyodo Sakusan, Japan 2,20,000. Hoechst FRG 2,25,000.

Indian manufacturers of acetic acid,

whose average capacity is around a paltry 5,000 tonnes per annum, are apprehensively awaiting the entry of giant methanol-based units in their midst. When the current annual consumption is only around 40,000 tonnes, creation of such huge capacities by a few would lead to the ruin of more than 15 alcohol-based units, they fear.

Promoters of new projects, however, discount such fears. According to them, the Government had taken into account the likely impact on alcohol-based units before granting Lis to the two parties. The methanol route is a closely-held, state-of-the-art technology which the Government is keen on bringing into the country.

The Government's decision, they point out, follows the recommendations contained in the Ganguly committee report, which even suggested the switch-over of the existing acetic acid plants to the methanol route. This, of course, is impracticable, as the exist-

ing plants are not designed to accept methanol as a feedstock.

The current demand for acetic acid is around 40,000 tonnes per annum. The following are the major consuming industries and their approximate consumption: chemicals 5,000 tonnes, esters 6,000 tonnes, VAM 3,500 tonnes, acetic anhydride 13,000 tonnes, dyestuffs 6,000 tonnes, pharmaceuticals 3,000 tonnes, textiles 3,500 tonnes and rubber latex 500 tonnes. If one adds the PTA requirement of RIL (10,000 tonnes), the total demand adds up to around 50,000 tonnes. This is the capacity granted to the two proposed methanol-based plants, who have Lis for 25,000 tonnes each.

The country has an installed capacity of about one lakh tonnes, distributed at more than 15 well-dispersed locations near distilleries, which can easily be further expanded to meet any growth in demand. The capacity utilisation of the existing units is only around 50 per cent, because of financial problems and problems in inter-State movement of alcohol because of various State levies. As such, alcohol-based units see no justification for erecting methanol-based plants in India.

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DRUG PRICE FIXATION:

3-Member panel to study complaints

The Department of Chemicals and Petrochemicals is setting up a three-member panel to look into the complaints regarding fixation and revision of drugs and formulation prices.

Termed as 'reviewing authority', this panel can be approached by manufacturers with any complaint about the price fixation of their products. The committee will be headed by a retired Government official, according to Mr. H. K. Khan, Secretary, Department of Chemicals and Petrochemicals.

The Department has also plans to set up a co-ordination committee with representatives from the manufacturers to sort out their problems. Mr. Khan said at the award distribution function of the Indian Drug Manufacturers Association (IDMA) in Bombay.

A new incentive scheme for export-oriented pharmaceutical units is also being worked out. Under this scheme, units with a targeted export programme will be given certain priority treatment in clearing their documents. They are expected to achieve the export targets every year.

Referring to the trade margin, Mr. Khan said certain modifications in the margins will be announced within a week. However, he clarified that the new Drug Price Control Order (DPCO) is not operational because of certain problems regarding trade margins.

The Government is initiating steps to rationalise the duty structure in the industry. Some major changes are likely to be made in the forthcoming Budget, he indicated. Steps are also being taken to simplify the procedural formalities in order to reduce the paper work, he added.

Mr. Khan said a committee on norms will be finalising the mark-up revisions shortly. Efforts are being made to create a congenial climate for the growth of the industry by reducing the span of control, increasing the mark-ups on the price-controlled medicines and by trying to evolve systems and procedures to give speedy clearance to the industry's representations.

Mr. J. Vengal Rao, Union Industry Minister, in his speech which was read out in his absence by the Joint Secretary, Department of Chemicals and Petrochemicals, called for higher investments in research and development in the pharmaceutical field. At present, such investments by manufacturers are only around two per cent of their turnover as against nine per cent in advanced countries.

(A detailed report on the IDMA award function will appear in the next issue of Chemical Weekly.)

INCREASE RANGES FROM 12.9 TO 43 P.C.:

PRICES OF 172 DRUG FORMULATIONS RAISED

The government has revised the prices of 172 drug formulations — 80 listed in category I and 92 in category II of the DPCO, 1987. The price increase ranges from 12.9 per cent to as high as 43 per cent. A marginal price reduction to the extent of 12.5 per cent is also effected in certain items.

The price revision is in accordance with the changes in the MAPE (maximum allowable post manufacturing expenses) in the new DPCO. The government has fixed a MAPE of 75 per cent for category I formulations and 100 per cent for category II formulations.

The MAPE for category I formulations in the 1979 DPCO was only 40 per cent and for category II formulations it was 55 per cent. The third category of price controlled formulations had a MAPE of 100 per cent. In the 1987 DPCO, however, price controlled formulations are divided into only two categories.

According to informed sources, a price increase of 43 per cent is given to penicillin and aspirin formulations. Both these drugs are now listed in category II of the 1987 DPCO with a 100-per cent MAPE. Penicillin formulations are marketed mainly by Sarabhais, Alembic, Pfizer and Hindustan Antibiotics while aspirin formulations are marketed by Nicholas Laboratories and Reckitt & Coleman.

The increase in the prices of tetracycline, oxytetracycline, novalgin, and frusamide formulations would be 25 per cent. Hoechst will be a major beneficiary in this sector as it is marketing formulations of tetracycline, analgin and frusamide. Sarabhais are marketing tetracycline and oxytetracycline formulations. A large part of the Pfizer's turnover is originating from the marketing of oxytetracycline formulations.

The prices of the 4 anti-TB drug formulations based on isoniazid, pyrazinamide, streptomycin and thiacetzone will be up by 25 per cent with the change in MAPE in new DPCO. All these drugs are in category I with a 75 per cent MAPE. However, the price of ethambutol formulations, a widely used anti-TB drug has been reduced by 12.5 per cent. Ethambutol formulations were in category III of the 1979 DPCO with a 100 per cent MAPE. These formulations are now in category I of the new DPCO. Pfizer, Sarabhais and HAL will benefit from the increase in the prices of 4 anti-TB drug formulations as they are market leaders in these items. The reduction in the price of ethambutol formulation may hit Cyanamid and Lupin Laboratories.

There is a 25 per cent increase in the price of dapsone formulations, an anti-leprosy drug. Burroughs Wellcome is a leading manufacturer of dapsone formulations in the country.

The price of chloroquin formulations, an anti-malarial drug, is also raised by 12.9 per cent. These formulations are marketed mainly by Tata Pharma and Bayer.

A reduction in the price of 12.5 per cent has been effected on two anti-blindness drugs, namely, acetazolamide and sulphacetamide. Both are widely used formulations in the country currently.

CHANGE IN EXPORTS (CONTROL) ORDER

The Government has amended the Exports (Control) Order, 1977.

As per this amendment, in the clause 15, for sub-clause (J), the following sub-clause shall be substituted, namely: "(J) products manufactured in and exported from the respective free trade zones and approved 100 per cent export-oriented units except textile items covered by bilateral agreements.

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NO DECISION ON PRESCRIPTION FEE:

Implementation of DPCO delayed

The Kelkar Committee's proposal to introduce a fee for handling of prescriptions by retail chemists has created a stalemate in implementing the Drugs Prices Control Order, 1987.

The committee has proposed a fee of 50 paise, chargeable by retail chemists, for handling a prescription during day time and Re. one per prescription during night, between 9 pm to 7 am.

The committee had also suggested a uniform rate of retail trade margin at 15.5 per cent on price controlled drug formulations. These changes, to be incorporated in the DPCO, 1987, were agreed upon by both drug industry and pharmaceutical trade in a joint meeting last December.

The government was to have effected these changes in the DPCO immediately after the agreement. And the

drug industry has been waiting for the government's notification since then.

Informed sources in Bombay say that the government is now having second thoughts on the provision relating to prescription charges to chemists. The government's hesitation to include this provision in the DPCO is because of the fear of strong public opposition to such a levy.

Prices of most of the medicines are bound to go up with the implementation of the new DPCO with the increased MAPE (maximum allowable post manufacturing expenses) to drug units and higher trade margins.

Chemists fee for handling prescription would then be an additional burden on the public, as in many cases people have to go to more than one medical store for getting all the medicines listed in a prescription, sources say.

It also happens quite often that a patient does not purchase all the medicines prescribed at one time. It would mean that a patient will have to pay a prescription fee more than once to the chemists.

The sources point out that a fee of Re. one for handling prescriptions during night, between 9 pm to 7 am, could be justified considering the trouble chemists take for keeping their establishments open during those hours.

A decision to drop this controversial proposal at this stage would invite strong opposition from retail chemists as it was agreed upon at the December meeting.

As it is, retail chemists are not very happy about the agreement reached then. The retail trade margin was brought down to a uniform rate of 15 per cent for price controlled formulations from the originally fixed levels of 17 per cent for ethical drugs and 10 per cent for non-ethical drugs in the 1987 DPCO.

The newly proposed retail margin of 15.5 per cent is, however, higher than the margin allowed under the 1979 DPCO. The retail margin was 12 per cent for ethical drugs and 10 per cent for non-ethical drugs in the 1979 DPCO.

HIGH DOSES OF VITAMINS MAY PROVE TOXIC

Parents who stuff their children with vitamin tablets to make them more intelligent could be poisoning them instead, doctors say.

Chemists shops in Britain have reported a rush to buy vitamin pills after two studies said the pills would boost a child's intelligence quotient and curb aggressive behaviour.

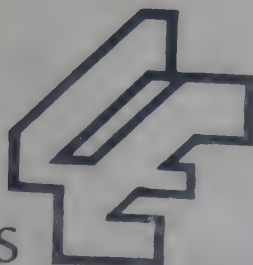
Doctors said that very high doses of Vitamin B, C and D over a long period could prove toxic, leading to kidney damage, gallstones and paralysis of nerves in the hands and feet.

Dr. Andrew Tomkin, a nutrition expert at London University, said: "People think that because one tablet does you good, several will be even better."

"People are keen to improve their children's intelligence but there is always the possibility that if you give a child too many vitamins you will do more harm than good."

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RESEARCH & DEVELOPMENT

New methods to handle toxic waste

For decades, environmental engineers in the US cleaned up toxic waste one way by enclosing and burying it, either in landfills or at the site. But this approach has proved inadequate for a number of reasons. Although enclosed in drums and carefully buried, the dangerous waste often leaks, contaminating its surroundings. In addition, the number of available landfills is declining because of more rigorous federal guidelines.

Now engineers have devised a wide range of methods, some new and others based on existing technologies, to destroy or detoxify hazardous waste. The techniques include incineration — solidification, which involves converting the waste into a solid, more stable form — use of microbes to break down the waste into safe substances, and vacuuming up toxic material like gasoline for reuse.

The leading technologies involve destroying waste by burning it. High-temperature incineration, in which a waste is burned again and again to ensure destruction, is one of the most widely used approaches. Another is fluidised-bed burning, in which wastes are superheated and passed over a bed of sand to hasten their combustion. In addition, more exotic thermal technologies, such as the pyroplasma system developed by Westinghouse Plasma Systems show promise. The Westinghouse system employs an electric arc to produce a very hot plasma that breaks down the chemicals in the waste into atoms so that they can reform into non-hazardous compounds.

Another promising technique is bio-degradation technology, in which microorganisms introduced into the contaminated area consume the hazardous waste. In most cases, the organisms already exist in the contaminated soil or ground water. Engineers simply make the environment more conducive to growth among the organisms. To accomplish this, the contaminated area might be fertilised with lime or hydrogen peroxide. Once the microorganisms flourish, they break down the hydrocarbon chain, reducing the compound to its elemental state.

In other cases, engineers may genetically design a microbe that will eat a specific hazardous waste site but they had little success in producing effective microbes. Depending on the time needed to clean up a hazardous waste site, bio-degradation can be a far more economical process than most incineration techniques, according to a genetic engineer at Remedial Technologies, a Boston-based firm that specialises in bio-degradation processes.

Solidification is also becoming a preferred technique. By mixing various chemicals with toxic sludge and liquid waste or melting the contaminated soil or sludge and then allowing it to harden, engineers can solidify the waste so it can be more safely and permanently buried. Soil flushing and vacuuming are also used from time to time to

loosen the contaminants from the soil so that they can be washed away. In vacuuming, high vapour pressure is used to draw volatile substances from the ground.

VANADIUM SOLUTION FOR RECHARGEABLE BATTERIES

In the UK, researchers from the University of New South Wales have developed a rechargeable storage battery which can store solar or wind energy in remote areas and can act as a source of power for electric vehicles.

It uses an electrically charged vanadium solution instead of the conventional charged plates of lead acid batteries. This means it can easily be recharged by changing the solution. It is based on an idea known as the NASA redox flow cell concept, in which two vanadium solutions are pumped separately through adjacent half cells.

The two solutions differ only in their state of oxidation — one is positive the other negative. Electricity is created by the exchange of electrons between the solutions. Conventional redox cells rely on solutions of iron and chromium compounds which leads to problems of cross contamination as the solutions diffuse across the membrane separating them.

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Rs. 15 cr. for superconductivity research

The first rupee on superconductivity research and development is likely to be spent by the government in a few weeks. At a high-powered meeting held recently in the Prime Minister's Secretariat to decide on the priority programmes and resource allocations in this rapidly developing area funding to the extent of Rs. 15 crores has been accepted by the Government. This was the money recommended by the co-ordinating committee for research in superconductivity under the chairmanship of Prof. C. N. R. Rao, who is also the Chairman of the Science Advisory Council to the Prime Minister (SAC-PM). This decision comes more than a year after the achievement of the major scientific breakthrough of High-Temperature Superconductivity (HTS) where Indian scientists have also made some kind of world mark.

In the hierarchy of bodies set up to formulate and implement a co-ordinated programme of research since the first efforts of the Indian scientific community produced results in HTS, the highest is the Apex Body headed by the Prime Minister, Mr. Rajiv Gandhi. The AB includes the heads of various Government departments and bureaucrats from different ministries as well as Prof. Rao and a few other scientists.

The AB expresses the political will of the Government actively to support R&D in HTS. Under this AB is Prof. Rao's co-ordinating committee, called

the Project Management Board (PMB), and has as its members representatives from the various institutes, industries and agencies involved in HTS research. The PMB functions under the aegis of the Department of Science and Technology (DST).

Two task forces formed:

Given the mandate of the PMB to identify areas of R&D in HTS and make recommendations on the funding patterns for a national action plan to the AB, the Board had in turn constituted two task forces, one on basic research and the other on technology applications, with experts in the field drawn from various institutes actively engaged in research in the field. The task force for basic research is headed by Prof. R. Vijayaraghavan of the Tata Institute of Fundamental Research (TIFR), Bombay, and has Prof. T. V. Ramakrishnan of the Indian Institute of Science (IISc.), Bangalore, as the co-chairman and that on applications is chaired by Dr. P. K. Iyengar, Director, Bhabha Atomic Research Centre (BARC), and co-chaired by Dr. Virendra Mohan, Chairman, Semiconductor Complex Ltd. (SCL), Chandigarh.

The task forces, after several meetings, had presented their reports to the PMB in December 1987. The required funding estimated by the task forces for carrying out significant research was of the order of Rs. 30 crores over a period of three years.

Speaking about basic research, Prof.

Vijayaraghavan said 'during the first few months of worldwide activity we were at par with several other institutions of the world. Currently there is an intensive study of materials using techniques which we lack in our country. This will be made up when this funding becomes available.'

On the applications front the areas identified are thin films, ceramic-based electronic materials, Josephson junctions and Superconducting Interference Devices (SQUIDS), development of superconducting wires and VLSI designs based on these new superconducting materials. Some of the institutions which have made proposals to the task forces are the BARC, the TIFR, the IISc, the IIT Madras and the National Physical Laboratory (NPL), New Delhi, in basic research and the Bharat Heavy Electricals Ltd. (BHEL), the BARC, the IIT Delhi and Kharagpur, the TIFR, the IISc, the Nuclear Fuel Complex (NFC), Hyderabad and the Central Electronic Engineering Research Institute (CEERI), Pilani, in technology applications.

Four centres to work on this films:

Prof. Rao said four centres had been identified to conduct work in the area of thin films, SCL for electronic applications, the NFC and the NPL for wires, the BHEL for making prototype generators and several places for material synthesis and preparation. The Indian Rare Earths Ltd. (IRE), Alwaye, has been given the charter of providing rare-earth materials in sufficient quantities to carry out a sustained programme of R&D.

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'Though the quality of research varies there is quite an amount of effort, but in the whole country we do not even have one good furnace to fabricate these new oxides. Most of the initial funding will go towards equipment and infrastructural development for basic research as well as technological applications', said Prof. Rao. Appropriate funding of research in some major centres, which will also include some fellowship schemes to give opportunities to the younger people, will also be met by the PMB through this amount, he said.

According to Prof. Vijayaraghavan, the task forces in their exercises had also catalogued the needs of institutions other than the leading institutions.

Seed money:

Apparently, the University Grants Commission (UGC), one of the agen-

cies represented in the PMB, has already provided seed money — of the order of a few crores apart from the expected direct money from the Government — for a broad — based funding to support training in the science, engineering and technology of superconductivity, which forms a component of the coordinated programme, either at the Ph.D or at the post-doctoral level research.

The Finance Secretary, who was present in the recent meeting, has promised that the money would become available before the annual budget. In fact, a notional sum of about Rs. 10 crores or so has already been allocated in the year's budget towards superconductivity research and the scientists have been promised that the additional amount of Rs. 5 crores will be found somehow.

Law likely to regulate molasses supply

The Union Government is considering adoption of a Central legislation to control distribution of molasses directly from the sugar factories to distilleries on the lines of the sugar control policy.

This was indicated at the annual meeting of the Central Molasses Board in New Delhi on Feb. 4.

The step is felt necessary in view of the artificial shortage of molasses in deficit States as a result of the fis-

cal and non-fiscal restrictions imposed by the surplus States.

The meeting was told that the Centre will allow the deficit States to import alcohol duty-free, if the surplus States failed to reduce substantially the export pass fee, charged for supply of the item to deficit States.

The question of stopping export of molasses outside the country is also under consideration.

Presiding over the meeting, the Union Industry Minister, Mr. J. Vengal

Rao, said only U.P., Maharashtra, Tamil Nadu and Pondicherry were surplus in molasses and alcohol.

The molasses position had been "particularly bad" during the year and has caused hardships to distilleries in many States, he said.

He said though large surplus stocks were reported from States like U.P. and Maharashtra, they did not offer "any quantity" for allocation to deficit States for distilling purposes.

Similarly, Mr. Rao said while the production of alcohol during the year had been at the expected level of 700 million litres, the actual consumption was well below expectation due to poor inter-State take-off.

The Minister was, however, "happy" to note that the surplus States did come forward in meeting all the requirement for molasses for cattle feed purposes.

In his address, the Minister of State for Chemicals and Petrochemicals, Mr. R. K. Jaichandra Singh, regretted that the surplus States underestimated their surplus figures to "avoid" allocation to the deficit States.

"It is well known that stocks of molasses are deteriorating in surplus States but they would not allot to deficit States", he said.

The meeting was attended, among others, by the Excise Ministers of several States.

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NEWS DIGEST

AONLA PROJECT TO BE COMMISSIONED IN MAY

The Rs. 695-crore Aonla gas-based fertiliser plant near Bareilly in Uttar Pradesh has been completed and it is expected to be commissioned in May.

The Aonla project of the Indian Farmers Fertiliser Co-operative (IFFCO) is one of the six gas-based fertiliser plants being set up on the Hazira-Bijaipur-Jagd'shpur (HBJ) pipeline. It has been completed as per schedule in 36 months, according to IFFCO sources. The Gas Authority of India has ensured that the supply of gas will be commissioned by next month. Though the targeted commissioning has been delayed because of delay in the supply of gas, efforts will be made by IFFCO to start production early by reducing and economising on the three months required for commissioning and trial activities, the sources said.

The Executive Director of the project, Mr. S. R. Sahore, said the Aonla complex included an ammonia plant with a capacity of producing 1,350 tonnes per day and urea plants with a capacity of producing 1,100 tonnes per day.

Mr. Sahore said the plant would produce 7.26 lakh tonnes of urea annually. It has received a World Bank loan of \$112 million and an Overseas Economic Co-operation Fund loan of 23 billion yen, he added.

FERTILIZER UNIT IN QATAR: INDIAN TEAM TO UNDERTAKE FEASIBILITY STUDY

India will shortly send a team of experts to carry out a feasibility survey for establishing a modern gas-based fertiliser plant in Qatar with buy-back arrangements for ammonia or urea produced by it and also for an aluminium plant based on raw materials from India.

The delegation will visit this oil gas-rich Gulf state in accordance with a decision taken at the end of three-day Indo-Qatar joint comm in Doha recently.

Qatar, which has the world's largest reserve of non-associated gas, is interested in seeking a firm commitment for fertilizers produced by it in return for iron ore from India. A delegation of the Qatar Steel Company will shortly visit the Kudremukh Iron Ore Company in Mangalore to finalise the order — expected to be of 15,000 tons.

The Indian side has identified Telecommunication Corporation of India Limited (TCIL), Engineers India Limited (EIL) and the Fertilisers Engineering Design Organisation (FEDO) for collaboration with Qatar Telecommunication and Industrial Projects. The Qatari side has agreed to consider hiring Indian companies and workers for maintenance services and sought Indian assistance in setting up a small scale industries.

WHITE PAPER ON WORKING OF PSUs SOON

The Central government was preparing a white paper on the public sector undertakings to review the system, objective and its philosophy, according to Mr. B. G. Deshmukh, Union Cabinet secretary.

Inaugurating the new training institute of the Gujarat State Fertiliser Corporation Mr. Deshmukh observed that the public sector undertakings will succeed only if there was understanding and co-operation between the government and management and Gujarat should take legitimate pride on this count.

Mr. H. K. Khan, Union petroleum secretary, referred to the current national debate on the role of public sector undertakings and said the human resource element played a critical role in motivation and training provided to the employees. He said that GSFC had taken the right step by giving importance to human resource development and hoped the training institute would prove to be a landmark in the country.

Mr. Moosa Raza, GSFC chairman and managing director, said his company believed in excellence and in search of excellence, it had selected the best location, the best technology, the



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ILs, 46 LIs ISSUED IN NOV.

Four firms were given letters of intent to manufacture leather shoes and a letter of intent given to a Calcutta-based firm to manufacture rubber and canvas footwear was converted into an industrial licence during November.

A Bangalore-based firm was given a letter of intent to manufacture sports footwear.

In all, 28 licences and 46 letters of intent were issued during the month.

Industry-wise, seven of the licences were for electrical equipment industry, three each for chemicals and drugs and pharmaceuticals, two each for metallurgical industry, telecommunication, industrial machinery, fertilisers, food processing, glass, cement and timber products.

Category-wise, 12 of the licences were for setting up new undertakings, nine for manufacturing new articles and seven for effecting substantial expansion.

One licence was surrendered and one was revoked.

Industry-wise, 10 of the letters of intent were for electrical equipment, six for textiles, five each for metallurgical industries and leather goods, four for chemicals, two each for industrial machinery, rubber goods, cement, transportation and vegetable oils, and one each for telecommunication, food processing, goods, medical appliances and soaps.

Category-wise, 26 of the letters were for setting up new undertakings, 12 for manufacturing new articles, seven for effecting substantial expansion and one for both setting up a new undertaking and manufacturing a new article.

While seven letters of intent were cancelled, three others lapsed.

Six companies coming under the purview of the Monopolies and Restrictive Trade Practices Act got licences and one a letter of intent.

POLYOLEFINS RESEARCH FACILITY AT IPCL

Energy Advisory Board Adviser and former Union Petroleum Secretary, Mr. Lavraj Kumar inaugurated a modern pilot scale polyolefins research fa-

cility at the public sector Indian Petrochemicals Corporation Ltd. (IPCL) complex in Baroda.

IPCL has set up the facility, described as the first of its kind in India, at a cost of Rs. 4.5 crore.

The facility will be used to carry out advanced research for the development of thermoplastics and elastomers using novel catalyst systems and state-of-the-art control systems, an IPCL spokesman said.

The project was a collaborative effort of IPCL and Engineers India Ltd to develop indigenous data base for the design and setting up of large-scale polymer plants in India in the future using locally developed catalysts, he said.

According to the spokesman, the pilot plant incorporates futuristic computer and micro-processor based control systems along with advanced equipment conceptualised, designed and engineered by IPCL and OIL scientists.

Plant safety and reliability of data for research and development purposes formed the basic design philosophy of the facility, he said.

The facility will also be used for process improvements, energy saving and improvements.

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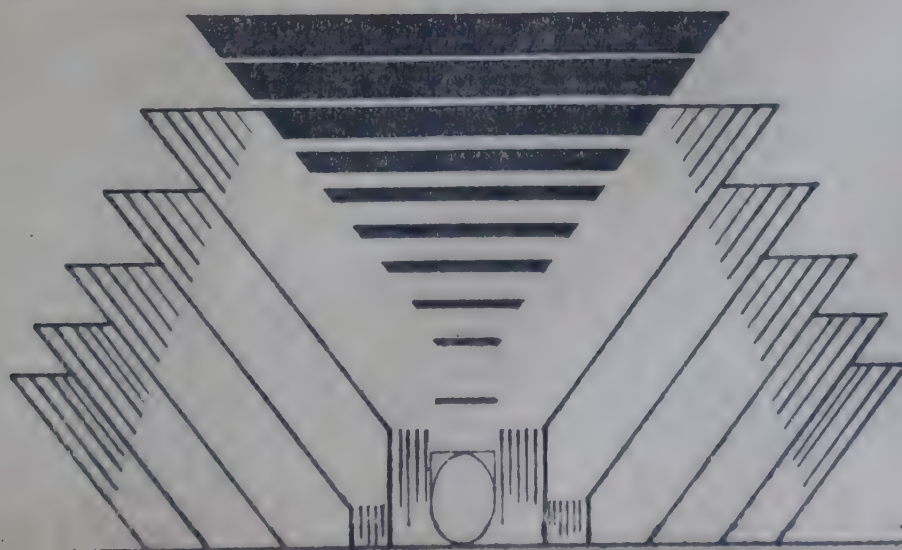
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FORMALDEHYDE PRODUCTION LICENSES SOLD IN CANADA, AUSTRALIA AND INDIA

Perstorp, Sweden, has received three orders for formaldehyde production licenses from chemical companies in Canada, Australia and India. The production process marketed under license by Perstorp now accounts for nearly 15 per cent of the world's total production of formaldehyde.

Reichhold Ltd., Canada's leading producer of formaldehyde, has booked an order for the Perstorp technique to produce 60,000 tons of formaldehyde per year at its plant in Ste. Therese. The Canadian company's formaldehyde is used in the production of resins and glue for the forestry industry.

The Reichhold order is the second production license sold in North America. The first, a prestigious order from Du Pont in the state of West Virginia, the site of the world's largest formaldehyde plant, was booked in 1987.

The order received from ICI Australia Pty Ltd. in Melbourne represents a breakthrough in the Australian market.

The formaldehyde production license from Perstorp will increase ICI's volume output by more than 50 per cent. Most of the formaldehyde produced by ICI goes to the glue and wood paneling industries.

Karoria Chemicals and Industries Ltd. of India placed the third order for a license to produce formaldehyde using the Perstorp technique. Formaldehyde is an important raw material in the production of polyalcohols, which the Indian chemical company produces at its plant in Ankieshwar.

The orders will provide the three licensees with access to an oxidation process developed and refined by Perstorp during the past 10 years. The Swedish company has sold more than 40 formaldehyde production licenses to chemical companies in all parts of the world.

NRDC AWARDS ANNOUNCED

The National Research Development Corporation (NRDC) has selected twelve inventions for the 1988 Republic Day awards for innovative inventions.

Through the awards, announced on 26th January, the prize award commit-

tee recognised developments in key areas of national importance like high efficiency thin film optical coatings required for space, defence and terrestrial applications, wear resistant material for improved life of bowl mill and grinder in thermal power plants and innovative pollution control device for treatment of municipal and industrial waste water.

Under its invention promotion programme the NRDC has also given awards for developments in high technology areas like a new technique for production of high frequency printed circuit board used in professional electronic equipment, educational robot, three dimensional map production techniques and economical jet dyeing machines required for the textile industry.

Dr. T. G. K. Murthy, Mr. C. L. Nagendra, Mr. M. Viswanathan, Mr. Rav S. Yalamanchi and Mrs. M. N. Annappa of the Indian Space Research Organisation, Bangalore, have been jointly awarded a sum of Rs. 30,000 for devising hardware and computer software for a whole range of optical coatings, anti-reflection coatings for use in the infrared range, super efficiency metal coatings and high efficiency silver coatings, for the visible and infrared ranges and special carbon coatings. These coatings are required for space, defence and terrestrial applications.

Mr. Anand Sureschandra Bal, Mr. Ahmed Noor Khan, Mr. Haridas Jagannath Patil and Mr. Andreas Charles Manuel of National Environmental Engineering Research Institute, Nagpur, will jointly receive Rs. 30,000 for the development of 'an improved rotating biological rope contactor for the treatment of biodegradable wastes. The pollution control device can be used effectively for treatment of municipal and industrial waste water and can be installed economically in small sizes.

Mr. Davendra Somabhai of Devrekha Engineers, Surat, has been awarded Rs. 15,000 for the development of economical jet dyeing machine for the textile industry.

Mr. Subbiah Guruviah, Mr. Meyyappa Sundaram, Mr. Venkata Subramania Chandrasekaran, Mr. Pokkayarth Jayakrishnan, Mr. Kannasabhanthi Reddy

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& Vydyanathan Ganesa Sarma of Al Electrochemicals Research Institute, Karaikudi, will jointly get Rs. 10 for developing 'radiation resistant coatings for nuclear power stations.'

ONGC TO SET UP BIOTECH INSTITUTE

The Oil and Natural Gas Commission (ONGC) plans to establish a research institute at Jorhat in Assam to explore the frontiers of petroleum technology.

The institute of biotechnology and geotectonic studies would undertake intensive research in the emerging technology of petroleum biotechnology and geotectonics, with special emphasis on application to petroleum exploration and exploitation in the north-eastern states of the country.

In a talk with reporters in New Delhi, the ONGC chairman, Col. S. P. Wahi, said that petroleum biotechnology explores the possibility of increasing the productivity and quality of hydrocarbons by studying the behaviour of certain microbes in its formation.

Col. Wahi said that ONGC also proposed to set up an institute of petroleum safety and environment management at Goa, in view of the growing need for inculcation of safety consciousness and environmental concern within those associated with the petroleum industry. The institute is estimated to cost Rs. 9 crores.

Col. Wahi said that an outlay of Rs. 248 crore had been provided to the ONGC, for its research and development activities in the seventh plan, as against a sum of Rs. 35 crore spent during the sixth plan on these activities.

Col. Wahi observed that ONGC also planned to undertake petroleum exploration activities in deep sea waters, at a depth of 200 metres.

The quantum of petroleum reserves in the Indian waters is estimated to be around five billion tonnes.

Seismic data to explore the possibility for deep water exploration was already being collected by ONGC scientists, he said.

BIO-ENERGY CENTRE AT TNAU SANCTIONED

The Government of India has sanctioned the establishment of a bio-energy centre at the Tamil Nadu Agricultural

University (TNAU), Coimbatore, at a cost of Rs. 12.76 lakhs, Mr. A. D. Jeyapandian, member, Board of TNAU management, who gave this information in Madurai said the board which met at Tuticorin had approved the proposal.

The new schemes for 1988-89 under agriculture, veterinary and animal sciences and fisheries were approved.

UCC DENIAL

The multinational Union Carbide Corporation denied that there was any 'collaboration agreement' in existence with its Indian affiliate, Union Carbide India Ltd. (UCIL), at the time of the gas leak at its Bhopal plant in December 1984.

In its amended written statement the Union Carbide said its collaboration agreement with UCIL expired on September 30, 1982.

The UCIL's application for renewal of the collaboration agreement on the same terms and conditions for a pe-

riod of seven years was not granted since modifications to the detriment of the UCC were imposed on the conditions of renewal. The UCC never signed the renewal agreement nor was the same filed with the Government as required, it said.

The statement said the allegations regarding continuing responsibility of the Union Carbide for the technical processes in Bhopal right up to the time of the disaster were false.

According to the statement the particulars provided by the Government of India even after the court's directive were "totally inadequate and insufficient and the UCC continued to be handicapped by the vague and general allegations.

The judge directed both the UCC counsels, Mr. B. R. Zaiwalla and Government of India counsel Mr. V. Parthasarathy to file within a fortnight the amended plaint as well as the amended written statement providing "better particulars." The judge also fixed the next hearing on February 19.

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Copper high despite duty cut

Despite substantial reduction in the import duty on copper wire bars from January this year, the prices are ruling remarkably firm and considerably higher than the corresponding period of the last year.

Effective from January one, the government reduced the duty from 140 per cent to 95 per cent (inclusive of five per cent drought surcharge). As a result, prices of copper bars were fixed lower at Rs. 75,500 per tonne by the Minerals and Metals Trading Corporation (MMTC), the channelising agency for the import of non-ferrous metals.

However, prices touched a new record at Rs. 80,000 per tonne in December 1987 as the MMTC had hiked the prices by Rs. 13,000 per tonne in that month. Subsequently, the copper wire prices recorded a whopping rise of 67 per cent during the year from Rs. 48,000 per tonne in January 1987. In fact, barring May-June last year, the MMTC had continuously revised the copper prices as the international supply had turned tight.

According to the PFI corporate service (corporate trends 25 Jan.), "the non-ferrous metals based industry has come to depend heavily on imports, as domestic production is quite inadequate in relation to the total demand."

"Consequently, the fortunes of these units swing in tune with the behaviour of the international markets where the copper prices have been displaying unusually firm trends. On the London Metal Exchange (LME) the prices touched record levels at pound sterling 1,720 per tonne in December."

The copper prices on LME ruled steady during the first-half on 1987 and was quoted between £875-1,000 per tonne. However, during the second half, the bullish trend gathered momentum and prices rose rapidly to cross £1,600 in November and touched an all-time of £1,720 in December.

The depreciation of rupee by more than 25 per cent against the pound sterling too contributed to the bullishness of copper prices in the domestic market.

Like many other non-ferrous metals the country is woefully short of copper as the domestic production has not kept pace with the growing international demand. While the total production of copper in the country is placed 40,000 tonnes, the total demand has already exceeded 1,00,000 tonnes, thus necessitating sizeable imports.

The total global production of copper in 1987 was estimated at 7.54 million tonnes while the consumption was placed at 7.64 million tonnes. By the current reckoning, while the prices are likely to rule firm at least in the first few months of the current year, the production is unlikely to move up substantially on the global level.

The MMTC which is the canalising agency, fixes the copper prices on the basis of the international price behaviour.

Earlier, imported copper attracted a basic duty of 95 per cent, an auxiliary duty of 45 per cent and surcharge of five per cent to bring the total imports to 145 per cent. As has been already mentioned, the duties have been reduced to 95 per cent effective from this month, although the non-ferrous metals industry had pleaded for a reduction of total duties to 70 per cent.

The copper-based industries have called for a rationalised price structure and further reduction in the import duty. The Bureau of Industrial Costs and Prices (BICP) is also engaged in working out a price formula for this important non-ferrous metal.

ALUMINIUM PLANT TO BE SET UP IN SINDRI

A Rs. 1,000-crore two-lakh tonne capacity aluminium plant would be soon set up at Sindri in Bihar.

Development commissioner, Mr. N. K. Singh said that the plant would be based on the downstream development of the Mukunda coalfields development programme under the Dhanbad district which forms a part of the Indo-Soviet agreement.

Mr. Singh said a broad approach involving the integrated development of the Mukunda coalfields, Mukunda power stations and the integrated aluminium project would satisfy a long standing demand of the people of tribal Bihar since they would help process rich bauxite deposits in the region and at the same time the benefits of employment and income would go to the people of the area particularly the tribals.

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Fert . distribution network to be strengthened

The government is considering a package of measures to strengthen distribution of fertilisers by co-operatives. The share of co-operatives in fertiliser distribution, which used to be over 70 per cent in the sixties, came down to 35 per cent in 1986-87.

It is partly attributed to the multi-agency approach adopted for fertiliser distribution, but the government is of the view that added efforts are required for strengthening the co-operative system.

Official sources say that the system of distribution of fertilisers by co-operatives in some states needs review for reducing the costs of handling as also for rationalisation of distribution margins between the co-operatives with a view to ensuring viability of co-operative outlets.

The sources say that the present margins allowed to co-operatives are inadequate and these tend to undermine their competitiveness in the market. The G.V.K. Rao Committee appointed by the government has gone into the question of margins for co-operatives and has submitted its report to the government. An early decision on the report is essential to restore the health of the co-operatives.

While revising the distribution margins for co-operatives it should be recognised that co-operatives are required to and actually maintain buffer stocks of fertilisers with a view not only to ensuring smooth distribution of fertilisers, but also to moving fertilisers to interior and even inaccessible areas. The private trade, by and large, does not maintain such buffer stocks.

Iffco and Kribhco are farmers' organisations, and these form a unique feature in the fertiliser industry. Moreover, both Iffco and Kribhco are obliged by their charter to use only the co-operative channel for their marketing. The structure and marketing of these two organisations, therefore, single them out from any other manufacturer in the private or public sector of the fertiliser industry. The sources say that the special features of Iffco and Kribhco need to be taken into account for the fertiliser distribution.

The fertiliser distribution by co-operatives is largely by way of sanction B-component loan under the crop loan system. It is estimated that nearly 70

per cent of the fertilisers sold by co-operatives are by way of the B-component loan to farmers and the cash sale of co-operatives account for hardly 30 per cent of the total sale. Because of the overdue position in many of the co-operatives, the production credit has dried up.

In the interest of production, it has been suggested to the government that even in respect of co-operatives where there are overdues, B-component loan in kind may be allowed so that this loan is utilised only for increased production.

The Ardhanareeswaran Committee, which reviewed the working capital requirements of co-operatives for input recommended that in as much as the selective credit control is basically directed to curb the speculative tendency in the market, and as co-operatives are not interested or involved in speculation, the credit to co-operatives for delivery of inputs as also marketing of outputs should be made on more liberal terms.

It is being impressed upon the government that a favourable decision regarding reduction of rate of interest to 14 per cent in case of state-level co-operatives and 11.5 per cent upto Rs. one lakh to co-operative retail agencies will go a long way in expanding distribution of fertilisers.

NFC UREA UNIT GOES ON STREAM

The Vijalpur plant of the National Fertilizer Corporation has started production of urea and the first consignment of the finished product was sent to Agra recently.

A factory spokesman said the Rs. 600 crore factory, based on natural gas from Bombay High, was one of the proposed gas-based plants for fertilizers. It has a production capacity of 2,200 tonnes of urea per day.

FACT FACELIFT SOON

The Fertilisers and Chemicals Travancore Ltd., Kerala, has been asked to submit a feasibility report on replacing its old plants with modern ones.

The Fertilisers Ministry has decided to process the cases relating to modernisation of plants, the Minister of State for Fertilizers, Mr. R. Prabhū has said in a letter to Prof. K. V. Thomas, MP.

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Demand for LAB increasing

The consumption of detergents which had increased to 7,20,000 tonnes per annum from a meagre 93,000 tonnes in 1975 is expected to capture about 50 per cent of the total washing product market by the end of the decade.

According to a recent study conducted by the Indian Petrochemicals Corporation (IPCL), in view of this rising demand of synthetic detergents, the demand for linear alkyl benzene (LAB), the basic raw material for the manufacture of detergents was expected to go up to 1,45,000 tonnes per annum by 1990.

For increasing LAB production, IPCL had already added one more unit to its LAB plant in Baroda. With the addition of this unit, IPCL would be able to process 3,20,000 tonnes of kerosene per year which would increase LAB production to 43,500 tonnes per year by 1988.

The existing plant is tuned to process 1,48,000 tonnes of kerosene to produce 30,000 tonnes of LAB.

Two more companies, Reliance and Tamil Nadu Petrochemicals have also

gone in for the production of LAB with capacities of 50,000 tonnes per annum each. According to the IPCL study with these three companies the availability of LAB by 1990 would go up to 1,43,000 tonnes.

Others like Nirma, Tata's and Hindusthan Levers were also in the fray to get industrial licences for production of LAB, the study paper added.

Giving a brief scenario of the washing product market in the country, the study noted that the consumption of detergent powder during 1985 had amounted to 3,70,000 tonnes, while that of detergent cakes was 1,10,000 tonnes.

According to the paper, two brands, namely Surf and Nirma had a market share of 12 and 50 per cent respectively, while the small-scale sector accounted for 81 per cent against 19 per cent by the largest sector.

Meanwhile, to bridge the gap between demand and supply, imports of LAB has been on the rise. During 1981-82, imports of detergents alkylates amounted to 17,000 tonnes, which shot up to 45,000 tonnes in 1986-87.

CAPROLACTAM PROJECT: MODIS MAY TIE UP WITH W. GERMAN CO.

Negotiations are vigorously afoot for a joint venture agreement between the house of Modis and a well known German multinational chemical giant for the setting up of a Rs. 350-crore caprolactam project in India shortly, sources said in Davos (Switzerland) on Jan. 30.

The project, which is estimated to have a targeted production capacity of 50,000 tonnes per year, is expected to meet the acute shortage of caprolactam in the country presently being imported. The caprolactam plant will be set up in Rourkela, Orissa for which the state government has already allocated the requisite land and other facilities, it was understood.

The talks between the Modis and the foreign collaborator reportedly now center around the question of the mode of foreign participation as the foreign party is said to be wary of entering into equity participation in the light of stringent liabilities of foreign companies in the area of environmental pollution. This may be avoided if only a 'know-how' agreement is entered into.

Sources said that while the Orissa government has agreed to buy into the equity of the proposed venture, SAIL (Steel Authority of India Limited) authorities have also expressed an interest in equity participation, with the balance being available to the public. The project is estimated to take upto three years for commissioning after the agreement is finally signed.

WIRES MADE FROM SUPERCONDUCTOR

Scientists at the National Physical Laboratory (NPL) in New Delhi have succeeded in fabricating wires from a ceramic high temperature superconductor (HTS). The wire can carry current without any loss when cooled to liquid nitrogen temperature (-196°C), they have reported in the science journal *Pramana*.

The HTS wire was fabricated through powder metallurgy technique using silver as cladding material, Dr. R. G. Sharma of the NPL and his colleagues said.

A discovery by NPL scientists that addition of silver up to a concentration of 60 per cent did not spoil the superconducting state led to the development of silver as cladding material

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More duty-free imports allowed

The government has enlarged the list of raw materials which can be imported duty-free for the manufacture of intermediate products for export production under the advance licensing scheme.

Accordingly, more items have been added to annexure-II of appendix 19 of the import-export policy (volume I) through a public notice issued by the chief controller of imports and exports on January 27.

The duty-free imports of raw materials can be used in the manufacture of intermediate products which can be exported or supplied to producers of finished goods also for exports.

According to the public notice, terephthalic acid (PTA) can now be imported on a duty-free basis for the manufacture of polyester fibre/filament yarn for export.

Besides, 15 new entries have been added to annexure-II. These are given below in order of raw materials for import, and intermediate products for export production (in brackets):

- (1) Caprolactam (nylon tyre cord),
- (2) naphthionic acid, lead, zinc, manganese oxide, zirconium carbonate (naphthenate driers), (3) manganese oxide, zirconium carbonate, lead, zinc, cobalt, acetate, octoic acid (Octate driers),
- (4) high carbon steel wire rods (tyre bead wires), (5) KTL aluminium pigots (aluminium foils), (6) sugar oxalic acid/diethyl oxalate), (7) alcohol, phosphorous (diethyl thiophosphoryl chloride), (8) methanol, formaldehyde, palladium catalyst (butene di-ol), (9) phosphorous (phosphorous pentasulphide, phosphorous chloride, red phosphorous, phosphoric acid),
- (10) toluene, caustic soda (cresol, cresylic acid), (11) caprolactam, titanium dioxide, spin-oil, dyes and chemicals (nylon filament yarn), (12) high carbon wire rods, zinc (galvanised/ungalvanised steel wires), (13) zinc (zinc oxide), (14) acetate tow plasticisers, papers (cigarette filter rod), and
- (15) ammonia, caustic soda (sodium cyanide).

The amendments have been made in the public interest, the notification stated.

scheme to a number of rubber-based engineering export items with natural rubber content ranging from 50 per cent to 100 per cent. According to a notification issued by the Ministry of Commerce, these new items included within the purview of the scheme are rubber bush, rubber and metal-bonded parts, rubber scraps, exhaust suspension rubber, fan belts, rubber beading for doors, windows, windshield, rear glass and also in bonnet and dicky etc., oil seals and rubber pads for clutch, brake and accelerator pedal pads.

Under the natural rubber scheme subsidy is payable to exporters of rubber products to offset the losses incurred by them on account of the higher prices of indigenous raw rubber as compared to the international prices of the equivalent grade of rubber. The present decision to extend it to new rubber-based engineering items is a sequel to the policy decision taken earlier to supply

raw materials including rubber at international prices for export production, particularly in the engineering sector to enable the exporters to compete effectively in overseas markets.

The new items would be covered under the natural rubber subsidy scheme with effect from January 27. The terms, conditions and procedures regarding operation of the scheme will remain the same as notified by the Ministry on June 10, 1983. However, for obtaining input/output norms vis-a-vis determining the percentage of rubber content in an item, the exporters would have to approach the DGTD before applying for grant of subsidy under the scheme.

The items already eligible for subsidy under the NRS scheme in 1975 are: auto tyres, bicycle tyres, auto and bicycle tubes, rubber and canvas footwear, gum boots, rubber hoses, hot water bottles, air mattresses, insertion sheets/hospital sheets, rubber rings, surgical gloves, rubber mats, railway pads and rubber sheets and stoppers.

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Bombay High reserves may last longer

The field life of Bombay High is expected to be considerably longer than earlier estimated following the discovery of basement oil in significant quantities in the structure. The Chairman of the Oil and Natural Gas Commission, Col. S. P. Wahi, believes that the discovery has doubled the reserves in offshore Bombay oilfields.

The Indian sedimentary basin is estimated to have 16.6 billion tonnes of oil and oil equivalent of gas of which about 60 per cent is offshore deposits. Only 4.065-billion tonnes have been converted into geological inplace reserves, while three-fourth of the prognosticated resources remains to be so converted.

Increasing demand: In a talk with presspersons in New Delhi, Col. Wahi expressed the view that hydrocarbons will continue to occupy an important place in the overall energy mix and play a significant role as an energy source. Despite the emphasis laid by India on coal, the demand for petroleum has been going up by seven to eight per cent a year.

The key role in identifying hydrocar-

bon reserves as well as their exploitation is played by the ONGC. Its aggressive but innovative strategy, said Col. Wahi, would lead to an 80 per cent cumulative increase in the output of oil and oil equivalent of gas comprising 60 per cent in crude and 20 per cent in natural gas during the Seventh Plan.

The ONGC Chairman referred to the innovations that had been made in management policy. Management advisory councils have been formed for exploration strategy and the offshore reserve division. Another advisory council would also look after management and corporate policy.

Role of cooperatives: The management is encouraging employees to form cooperatives to provide various services to the ONGC. With the involvement of cooperatives in short hole drilling in the Gujarat oilfields, productivity has improved, reserves optimised and costs reduced. In the north-eastern region, cooperatives are involved in a much bigger way in rendering a variety of services.

Col. Wahi also spoke enthusiastically

cally of the ONGC playing an important role in discovering and exploiting hydrocarbons in Vietnam and Tanzania. In both these countries negotiations are at an advanced stage, and the ONGC participation would be on a production sharing basis. Similar prospects in Malaysia are considered bright.

ONGC COMPLETES WORK ON PIPELINE

The Oil and Natural Gas Commission has more or less completed laying the pipeline from Narimanam in Thanjavur district to Nagapattinam to supply gas to the Nagapattinam Steel Rolling Mills. The pipeline traverses a distance of about 14 km and will transport gas from two wells at Narimanam.

ONGC sources said the "final pipe have been welded and we will carry out tests now. We hope to supply gas by the middle of February".

Meanwhile, ONGC is carrying out its drilling activities in the Cauvery onshore basin in Thanjavur and South Arcot districts. It has drilled a well up to 1,416 metres out of a targeted depth of 2,300 metres at Peruvalandai and up to 3,460 metres at Nannilam, both in Thanjavur district. A well has been drilled up to a depth of 2,072 metres out of a targeted depth of 5,150 metres at Komarakshi in South Arcot district.

A team from the USSR is also prospecting for oil and gas in the South Arcot district.

STEPS TO CUT ENERGY USE IN COAL MINING

A number of measures are being taken to reduce energy consumption and introduce electronics in coal mining.

This was stated by the coal secretary Mr. S. Varadan, at a meeting with visiting Chinese experts in coal mining in New Delhi recently.

Energy is mostly used for coal mining, coal transport, mine ventilation, pumping, coal handling and beneficiation and mine illumination. Care is taken in utilisation of energy for these purpose with optimum efficiency, he stated.

The Chinese delegation was led by Prof. Wu Zongxin, associate professor, Institute for Techno-economic and Energy Systems, Tsinghua University, Beijing.

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BPCL's refining capacity up

The Bharat Petroleum Corporation (BPCL), which has completed a decade in the mainstream of public sector undertakings, has made significant strides in relation to production, marketing, profitability and generation of internal resources.

Stressing the success of the BPCL since its inception in 1976, Mr. B. L. Ghabru, Calcutta area manager of the corporation, said that the corporation had a highly versatile refinery at Bombay which had increased its original installed capacity of 2.2 million tonnes per annum to six million tonnes.

The corporation also has many 'firsts' to its credit, including, processing of 26 different types of crude, in its refinery, capable of refining 100 per cent indigenous Bombay High crude, thus saving valuable foreign exchange.

The BPCL which was set up on January 24, 1976 following the nationalisation of the Burmah-Shell refineries, has submitted to the Union petroleum ministry, an ambitious project for raising the production capacity to 28.5 million tonnes per annum at the end of 2004-2005. Mr. Ghabru said that the proposed schemes included setting up of six grass root refineries in different parts of the country, laying of several cross-country crude and product pipelines and diversification of petrochemical products.

A look at the corporation's financial position revealed that the total capital employed in the corporation in 1976 was Rs. 4,850 lakhs, which had increased to Rs. 51,799 lakhs in 1986-87. The net profit of the corporation in 1986-87 was Rs. 60.32 crores as against Rs. 1.66 crores in 1976-77. Cash surplus generation in 1986-87 was Rs. 14,250 lakhs as compared to Rs. 260 lakhs in 1976-77.

Mr. Ghabru said that the corporation had taken up three energy conservation projects with World Bank assistance. Of these two projects — a new furnace for the high volume unit at Mahul near Bombay with a capital investment of Rs. 5.08 crores and additional exchanges and pre-heaters — had already been commissioned. The third project — co-boiler for the catalytic cracking unit — was under implementation. On completion these

projects would result in an estimated fuel saving of 39,200 tonnes annually, valued at Rs. 10 crores.

Besides, the corporation planned to install a captive power plant in its Bombay refinery for ensuring uninterrupted power supply to critical units at all times. This would, according to Mr. Ghabru, result in net saving of fuel to the tune of 27,900 tonnes per annum, worth Rs. 7 crores.

The BPCL has also initiated a number of environmental protection schemes to minimise pollution in refineries and modernised LPG bottling plants at nine locations in the country to cater to the needs of over 30 lakh consumers. Five more LPG bottling plants of the corporation would be set up in different parts of the country soon.

In the field of diversification of petroleum products, the corporation had successfully commissioned the aromatic plant phase I in its Bombay refinery. This plant is stated to be the largest in the country having a production capacity of 98,300 million tonnes of benzene and 17,600 million tonnes of toluene per annum, with an estimated capital investment of Rs. 56 crores.

This plant was erected and commissioned on indigenous technology and the BPCL was awarded the prestigious Indian Chemical Manufacturers Association award for forward development of technology in 1985.

The planned second phase of the plant, involving an investment of Rs. 269 crores, would be undertaken shortly for producing 10,800 m.t. of paraxylenes and 20,400 m.t. of orthoxylene per annum.

NEW DIRECTOR FOR CLRI

Dr. R. B. Mitra has taken charge as the Director of the Central Leather Research Institute (CLRI). He succeeds Dr. G. Thyagarajan who has gone on deputation as Scientific Adviser to the Secretary-General of the Commonwealth Science Council, London.

Dr. Mitra had been working with the National Chemical Laboratory, Pune, for the last 20 years and was its Scientist-Director for five years before joining the new post.

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SAIL to get Rs. 70 crores from Japan

A high-level team from the Overseas Economic Co-operation Fund (OECF) of Japan will be in Delhi in the first fortnight of this month to discuss soft loans for India on a Government to Government basis.

The Fund, aims to help set up and expedite projects on power, communication, railways, chemicals and fertilisers etc. which will be extended only to Government organisations and undertakings. In 1986 yen 50 billion (Rs. 400 crores) was allocated by the Fund.

SAIL's Rourkela fertilizer plant is likely to get Rs. 70 crores of the Fund aid. Its naphtha plant may be converted into a methanol plant at a cost of Rs. 17 crores and another naphtha plant may be set up at a cost of Rs. 30 crores. The nitric acid plant may be revamped with pollution control safeguards.

This Japanese assistance and the proposed World Bank loan of \$ 60 million will prove a shot in the arm for SAIL.

It is learnt that the Japanese are very keen to help SAIL in its by-productisation programme possibly after the fruitful co-operation in the case of Maruti Ltd.

In view of the serious marketing problems for benzene producers including SAIL the proposed caprolactum plant at Sindri will be an ideal outlet. The current capacity for benzene production in SAIL plants is about 50,000 tonnes per annum and is 20 per cent of the installed capacity in the country.

The caprolactum of FACT and GSFC are tied up with benzene with Cochin Refinery, and Koyali of IOC. The LAB plant of IPCL with benzene from IPCL or Koyali and the proposed polystyrene plant at Haldia with benzene that will be produced at Haldia Petro-Chemicals.

Supply of benzene and ammonia for the caprolactum project will serve as end of profitable utilisation of SAIL's benzene and ammonia.

Caprolactum prices in the world market have shot up from about \$ 1200 per tonne from the beginning of 1987 to about \$ 2000. New usages for this material in alloying with other plastics to produce plastic alloys of superior properties for applications in automobiles & other industries are reported to be the reasons for such hike. The demand in the

tion is limited to about 18,000 tonnes per annum.

GSFC is planning to expand the facilities to 50,000 tonnes per annum. FACT's 50,000 tonnes per annum plant will go on stream by 1989.

With only two caprolactum plants — one at Gujarat and the other at Kerala — there is tremendous scope for more caprolactum plants and hence SAIL is setting up a project at Sindri in the joint sector.

COMMODITY-WISE FOREIGN TRADE

POL IMPORTS UP BY 70.4 PER CENT

Details of the commodity-wise composition of India's foreign trade during the first half of 1987-88 according to a study of The Economic Times Research Bureau indicate a sizable spurt in the imports of petroleum crude and products; the import bill on this account is higher by as much as 70.4 per cent at Rs. 1,873 crores as compared to the same period of 1986-87.

Despite this, the growth in overall imports during the April-September 1987 period has been relatively modest at 12.6 per cent. This is because the value of non-oil imports recorded an increase of only 4.7 per cent during this period as compared to the corresponding months of 1986-87.

Exports during the first half of 1987-88 showed a noticeable buoyancy. The growth rate of overall exports during this period was 26.5 per cent. Apart from an impressive pick up in the exports of a large number of items which more than neutralised the setback in the case of a few commodities, the better exports performance so far in the current year stemmed from a steep rise in our exports of petroleum products. During the April-September period of 1987-88, our petroleum exports rose by Rs. 192 crores or 106.1 per cent to reach a level of Rs. 373 crores. In value terms, in fact, exports of petroleum products constituted one of the major items of exports during the first six months of the current fiscal year.

However, non-oil exports also maintained a good rate of growth thus far; such exports, as a whole, rose by 24 per cent during the first half of 1987-88 as compared to the same half of the previous year.

In the same case of exports, com-

increase in the value of exports of tea, marine products, leather products, chemicals, engineering goods, gems and jewellery, cotton fabrics, readymade garments, handicrafts and petroleum products... A setback is evident in the case of coffee, tobacco, spices, natural silk textiles, wool and woollen manufactures, jute manufactures and man-made textiles.

The value of imports during the first half of 1987-88 shows a rise in the case of edible oil, non-ferrous metals, petroleum products, pulp and waste paper, metalliferous ores, electric machinery, transport equipment, organic chemicals, artificial resins and textile yarn etc. On the other hand, a decline in imports is evident in cereals, fertilisers, cement, paper and paper board, iron and steel, non-electrical machinery, inorganic chemicals, and metal manufactures.

TARGETS BEING LOWERED FOR SEVERAL INDUSTRIES

The Seventh Plan capacity and production targets for several industries are being scaled down.

These industries include tractors, organised textile mill sector, fertilisers, industrial and professional electronics, sponge iron, refined copper, thermoplastics and synthetic rubber and methanol.

The production of nitrogenous fertilisers in 1989-90 is expected to be 64.61 lakh tonnes against a target of 65.60 lakh tonnes.

This is largely due to the disappointing progress in the three fertilizer plants allotted to the private sector along the H-B-J gas pipeline. The production of phosphatic fertilisers is, however, expected to be in line with the targets because of higher capacity utilisation.

Though the sponge iron industry has been delicensed, adequate capacity is not in sight and substantial imports of sponge iron and scrap have continued. Power shortage and the lack of demand from electric arc furnaces are largely held responsible for this.

The production build-up in the existing steel plants is now expected to be slower than what was assumed in the Plan. However, the implementation schedule of the Vizag steel plant has been expedited which will give higher production.

Refined copper target is being reduced because of problems of min-

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Hydrocarbons as energy source mooted

Hydrocarbons could play a significant role in the years to come, according to Mr. Vijay Kelkar, chairman, Bureau of Industrial Costs and Prices, (BICP). Addressing the Indian chamber of commerce on the subject "towards a new energy policy" at Calcutta on January 29, Mr. Kelkar observed that in view of the fast diminishing biomass resources, the increasing dependence of the agricultural sector on power, the relatively higher price increases in coal vis-a-vis price increases of other commodities in the economy and increasing transport costs, hydrocarbons could perhaps provide some of the answers to the country's power problems.

Mr. Kelkar pointed out that the rate of growth of power consumption by the agricultural sector per unit of output was far higher than that of any other sector. To meet the growing power needs of this sector and others, in terms of quality, quantity and reasonable prices, it was imperative to look for alternative sources of energy. A major portion of the coal produced came from opencast mines where mechanisation was necessary involving heavy capital expenditure. It had been seen that for every additional tonne of coal produced the capital cost component was as high as 50 per cent. In addition, transportation costs had added to the coal costs to consumers.

In this background it might be fruitful to explore the possibilities of using imported hydrocarbons, he felt. Assuming that international prices of oil remained more or less steady during the next 10 years at around US \$ 18 per barrel or even providing for a 50 per cent hike in prices taking them to between US \$ 25 and 27 and also providing another 25 per cent for additional cost, use of hydrocarbons would still be more economical, he said. Operation and maintenance costs too were considerably lower for hydrocarbon-based plants, he noted.

Besides being cost effective, hydrocarbons had other advantages in that they were environmentally least damaging and could provide quality power in quicker time. Among the possible drawbacks could be the foreign exchange implications, which, he felt, need not necessarily be very large. As far as the

question of dependence on the rest of the world was concerned, since the gas would have to be transported through pipes, the dependence between buyer and seller would be by and large mutual. In fact once a national pipe grid had been set up it would be possible to exploit domestic resources and it would also be easier to gasify coal.

IRE kerala plant safe : expert panel

The expert committee appointed by the Union Government to look into the alleged radiation hazards at the Alwaye plant of Indian Rare Earths (IRE) Ltd. in Kerala has concluded that the plant is safe from radiation.

The committee has observed that the radiation control methods being adopted in the plant are most appropriate and radiation exposures received by the workers are below the maximum permissible levels recommended by the International Commission on Radiation Protection (ICRP).

Further, it observed that the improvements in process technology, which have not only reduced the levels of radioactivity in the marketable products such as rare earths chloride but also reduced the discharging of radioactivity in the Periyar river substantially, as an achievement in effluent management by IRE.

The committee, which was appointed on June 18, 1987 and submitted its report in November last, had as members Dr. M.S. Valiathan, Director, Chitra Tirunal Institute of Medical Science and Technology, Trivandrum, Prof. N. Balakrishnan Nair, ex-officio, Secretary and Chairman of the State Committee on Science, Technology and Environment, Trivandrum, Dr. B.D. Gupta, Professor and Head of the Department of Radio-therapy Post Graduate Institute of Medication, Education and Research, Chandigarh, and Dr. K. Sundaram, former Director, Biomedical Group, BARC.

The committee report, which was made available to newsmen in Bombay on Jan. 29, by the IRE Managing Director, Dr. R.K. Garg, noted that "Systematic environmental survey of the Periyar river water since 1974-1986 provided adequate information to ensure that the levels

Earlier, the chamber president, Mr. Rajive Kaul, noted that while it was heartening to see an increase in the plant load factor of power plants over the past few years from 48 per cent to around 53 per cent, it was doubtful whether the Seventh Plan targets for enhancing installed capacity would be achieved. At the same time, transmission and distribution losses at around 21 per cent continued to be one of the highest in the world.

of discharges made from the plant during normal operations had not significantly contributed to the Ra (radium) 228 levels in the river water.

The Ra 228 content in the river was already at 10 per cent of maximum permissible concentration (MPC) for drinking water for the general public, which contributed by the geochemical processes from the catchment area of the river."

Although industrial discharges enhanced the radium levels in the river water, they were quite below the MPC for drinking water, even at locations in close proximity to the outfall, it added. Noteworthy among its recommendations are: construction of special silos for long-term storage of thorium and prompt measures to halt seepage of effluents from nearby industries.

It has also observed that the 600-odd employees of the factory were covered under the Employees State Insurance Scheme but the medical facilities at the plant could be best described as a first aid post without maintaining any personal medical files of the employees. However, the IRE management had extended comprehensive medical care and a full-time medical officer had been appointed.

On incidences of cancer and mortality therefrom the analysis carried out using the sex and age specific rates (ASR) for Bangalore to take care of ethnic and other similarities (in the absence of ASR available for Kerala), the committee concluded that there was no evidence to demonstrate that workers at IRE had a higher risk of cancer than that in the general population. It may be noted that population-based statistics on cancer was available for only cities like Delhi, Chandigarh,

New energy sources hold key to progress'

ould India pursue the Western approach to development or adopt indigenous strategy?

Two eminent scientists advocated radically different views on this at a national workshop on the applications of high technology in rural development at Mahabalipuram recently.

Atomic Energy Commission Chairman M. R. Srinivasan claimed that Government's programme provided the only "available path to progress", while Central Additional Secretary (Science and Technology) Shok Parthasarathi said this would only lead to disaster."

Disputing Mr. Srinivasan's faith in current developmental schemes, Mr. Parthasarathi pleaded for a wholly new approach that would integrate both rural and urban development.

"India is in a unique situation. Our high population levels do not permit us to ape the West. We must do it alone", he said in his keynote address to the workshop.

Both, however, agreed that in the face of the rapid depletion of fossil fuels, all forms of non-conventional energy sources needed to be tapped, and recommended development of all possible energy types for rural development.

"We suffer from a technology fixation". Technology had been the touchstone of all developmental plans, Mr. Parthasarathi said, condemning the emphasis on 'industrial muscle.' A new pluralistic approach which would eventually redefine the rural-urban relationship should be adopted, he urged.

Mr. Parthasarathi, painting a gloomy picture of the country's future, called for a "sustainable development strategy", — based on new 'modern' industries that utilise non-conventional energy sources. The newly-adopted technology missions were the first step towards rural development; the drinking water scheme in particular had made remarkable progress, he added.

Mr. Srinivasan too called for a revitalisation of the educational system. His inaugural address decried the absence of any interaction between educational institutions and rural development programmes. "Our education system is elitist," he said.

Atomic energy had already found rural application, the AEC chairman

said citing the example of irradiation of onions and potatoes. This had helped reduce losses incurred by poor storage and mismanagement.

The two-day workshop is expected to focus on high technology, and

Brazil, Norway lead in renewable energy

Brazil and Norway are leading the way in switching from fossil fuels to renewable energy sources, according to a study released recently.

The Worldwatch Institute said in a report that Israel, Japan, the Philippines and Sweden were also decreasing reliance on fossil fuels in favour of charcoal, wood and water power.

However, it said governments had to do more if renewable energy sources were to become a major global alternative to oil and coal.

The author of the report, Cynthia Pollock Shea, a Worldwatch staff researcher in economics and the environment, said, "Renewables offer a timely alternative to dwindling oil supplies and to environmentally damaging coal combustion". Some countries were taking advantage of it, she added.

She said Brazil was getting 59 per cent of its energy from renewable sources, chiefly hydro-electric, and Norway, an oil exporter, gets most of its energy from hydro-electric power and wood.

She said that after the Chernobyl nuclear accident in the Soviet Union, government support for renewal energy sources, chiefly solar, increased in Italy, Spain and West Germany.

She said Denmark and the Netherlands were promoting wind turbines, and India planned by year 2000 to get more electricity from small-scale renewable sources than from its nuclear programme.

"But, almost 15 years after the first major oil price rise wrecked havoc on the world's economics and spurred action to develop renewable energy technologies, erratic government support still hampers progress", she added.

Progress was further set back, Shea said, when world oil prices fell sharply in 1986.

To promote renewable energy, Shea called on governments to end price subsidies for fossil fuels and to increase research and development money for renewable energy projects. She also called for international re-

its transfer and reapplication in the rural milieu. Sponsored by the Department of Science and Technology it is being held at the United Nations University extension by the Murugappa Chettiar Research Centre, (MCRC).

search co-operation, especially with developing nations, where renewable energy can be used to avoid spending scarce foreign exchange for imported oil.

Half of all developing countries import oil for three-quarters of their commercial energy needs, Shea said. "Yet sunshine, wind, water and biomass are all available locally".

INDIAN ENERGY BID COMPREHENSIVE

India is among the few countries which are investing heavily in renewable energy, according to the Worldwatch Institute.

In India, slightly less than half of total energy use is provided by renewables, most of which is non-commercial fuel wood, agricultural wastes and animal dung, the environmental study group based in Washington said.

The country's department of non-conventional energy sources, Worldwatch notes, has drawn up a plan to build 15,000 megawatts of renewably based electricity by 2000. This is in addition to the country's large hydro programme.

Wind turbines and bio-mass technologies would make the greatest contributions, followed by small hydro-electric and solar thermal power stations and an even smaller share from bio-gas and municipal refuse burning facilities.

By the turn of the century, small-scale renewable energy technologies will contribute more to India's commercial energy supplies than will nuclear power, the study pointed out.

According to the paper, 223,560 megawatts of large hydro-electricity capacity will be added in developing countries between 1981 and 1995, more than half of which will be in India, Brazil and China. This is equivalent to 225 large nuclear plants, or 82 per cent of the world's nuclear capacity in 1986. India's hydro-electric operating capacity in 1980 was 11,794 megawatts. It was increased to 14,211 megawatts in 1985.

PETROLEUM PRODUCTS

Study to match refining capacity with demand

The Union Government has set up a study group to match refining capacity with the expected demand for petroleum products in the country.

Disclosing this at New Delhi on January 29, Mr. Brahm Dutt, Union Petroleum and Natural Gas Minister, said that the report of the study group will be available in two to three months.

Referring to the growing demand for petroleum products, Mr. Brahm Dutt said that it is important to be self-reliant in oil processing and said that a refining capacity of 100 million tonnes will be needed by the end of the century.

Refineries, he said, will have to be set up in the Eighth Plan, keeping in view the consumption pattern in various regions. The present refining capacity of 47.8 million tonnes is

sought to be augmented by the six-million tonne refinery at Karnal and the three million tonne petrochemical refinery at Mangalore. Another two million tonne refinery may come up in Assam.

To meet the future demand of petroleum products in the north-west and the Kayali-Kandla-Okha regions, the Indian Oil Corporation is to lay a 1,370 kilometre product pipeline from Kandla in Gujarat to Bhatinda in Punjab. The proposal, still under the consideration of the Government is estimated to cost Rs. 603.83 crores, the Minister said.

The Minister said that ONGC's gas processing complex at Hazira has made satisfactory progress and trial production in the LPG (cooking gas) plant started from December 24. The Hazira plant has an installed capacity of 1.91 lakh tonnes.

Referring to the difficult L situation, Mr. Brahm Dutt said the situation has improved considerably in the recent weeks and backlogs have been brought down over the country. Action is being taken to augment indigenous availability and also to increase LPG imports to the extent possible.

The Minister also announced that the Oil and Natural Gas Commission was considering setting up, in collaboration with Oil India Ltd., an Institute of Biotechnology and Gaseous Studies (INBIGS) in Assam to take up research in new emerging frontiers of technology, particularly as they relate to petroleum exploration in the north-eastern states.

The first of its kind in south Asia INBIGS will finally develop into a pioneering research institute in the entire region, the Minister added.

Mr. Brahm Dutt expressed the confidence that natural gas supply to the fertiliser plants coming up at Aonla and Jagdishpur and the power plant at Auraiya will be in time for their use.

The Minister said that Gas Authority of India, which started gas supply to the Bijaipur fertiliser plant in August last has so far supplied 8 million cubic metres of gas worth Rs. 23 crores to the plant.

From January 1, an average of 1.3 million cubic metres of gas is being supplied as per requirement of the Bijaipur plant.

Responding to a member's query, the Minister said that in Tripura, it is proposed to produce two lakh cubic metres of gas per day by 1990. Gas had been discovered in several wells in western Tripura. Eastern Tripura is considered even more promising and it is proposed to spend nearly Rs. 90 crores on exploration and development efforts in the next two years.

The Minister informed members that production of crude oil has commenced from the Bhuvanagiri well, which is the first oil discovery in the Cauvery sub-basin of Ariyalur-Pondicherry. The Narimanam well, put on production in 1985 has so far produced six lakh barrels of oil.

Mr. Brahm Dutt said that a new dimension to Godavari offshore prospects has risen following an oil strike in well GS-16-8 which flowed at the rate of 400 barrels of oil and 25,000 cubic metres of gas per day. Earlier, oil had been discovered in well GS-16-2, the Minister added.



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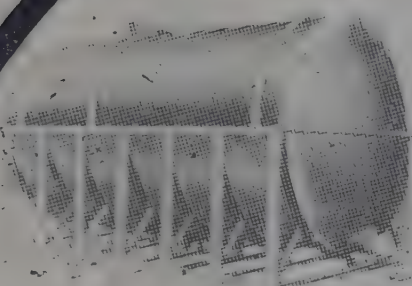
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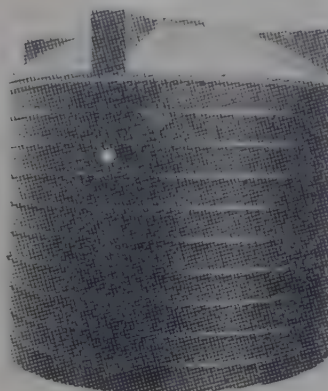
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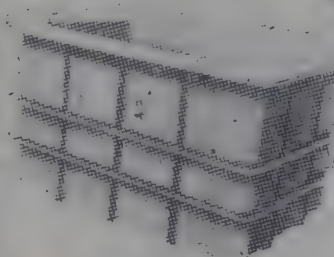
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Rs. 254 crores outlay for IOC

The Planning Commission has recommended an outlay of Rs. 253.84 crores for the Indian Oil Corporation (IOC) for 1988-89 against actual expenditure of Rs. 110.14 crores in 1986-87.

The new schemes envisaged by IOC during the next financial year include launching of the Kandla-Bhatinda pipeline and the creation of LPG import facilities at Hazira. The pipeline project seeks to supply deficit products in the north-west region through imports via Kandla port. The initial annual capacity of the pipeline will be three million tonnes in the Kandla-Karnal section and 1.5 million tonnes in the Karnal-Bhatinda section under stage-I.

The capacity of the project is to be expanded upto five million tonnes in the Kandla-Karnal section and two million tonnes in the Karnal-Bhatinda section under stage-II.

It is also proposed to have terminal facilities at Sidhpur, Jabalpur, Jaipur, Rewari, Sangrur, Bhatinda along the Kandla-Bhatinda pipeline with a total tankage of four lakh kilolitres.

Under the project to create LPG import facilities at Hazira, IOC will construct the required pipeline, tanks, loading bays and fire protection system. The project would help to receive import of LPG to supplement the indigenous availability in order to sustain the customers enrolment plan under the LPG phase-IV programme. The facilities would also help to optimise the overall cost of supply and distribution of LPG.

The main projects of IOC under implementation are: creation of additional secondary facilities at Gujarat refinery, launching of Karnal refinery and associated facilities, modernisation of Digboi refinery, completion of and marketing of LPG phase-III.

The Seventh Plan outlay for IOC is Rs. 958 crores and the expenditure during the first two years is Rs. 119.29 crores and Rs. 110.14 crores respectively. For 1988-89, IOC has proposed an outlay of Rs. 303.64

crores against which an outlay of Rs. 253.64 crores has been recommended.

4 MT. OF CRUDE OIL TO BE IMPORTED FROM USSR

India will import four million tonnes of crude oil and another 2.5 million tonnes of petroleum products from the Soviet Union during 1988.

A formal agreement to this effect was signed in New Delhi on Jan. 29. Mr. S.L. Khosla, chairman, Indian Oil Corporation and Mr. Vladimir A. Arutunian, chairman and managing director, Sojuzneft export (SNE), the Soviet foreign trade organisation.

The total value of imports from SNE during 1988 comprising both crude oil and petroleum products is expected to be about Rs. 1,300 crores. The entire import would be covered under rupee payments, thus saving precious foreign exchange for the country.

The pricing terms or rates for the purchases would be in line with prevailing international market prices.

Of the petroleum products to be imported under this agreement, the major products include high speed diesel oil 1.4 million tonnes and kerosene 1 million tonnes.

ONGC DEEP WATER EXPLORATION PLAN

The Oil and Natural Gas Commission (ONGC) has launched a deep water exploration programme to build up recoverable hydrocarbon reserve to face the growing energy demand.

An ONGC spokesman said that the programme to go up to 1997 started with the acquisition of seismic lines data processing and its interaction and drilling identified locations and field delineation.

He said there was immense potentialities of hydrocarbon reserve in the Indian sedimentary basin which covered an area of 1.72 square km. and prognosticated reserve of hydrocarbon in the sedimentary basin which is about 17 billion tonnes. Another 900 million tonnes of hydrocarbon reserve is in the continental slopes, the spokesman added.

He said that steep price hike of oil in the early eighties had prompted the State-owned and international

oil companies to look for alternate areas of oil exploration as the area of finding easy oil is fast dwindling.

This situation necessitated oil exploration in deeper waters. According to world statistics between 40-45 per cent of world oil reserve is in the off shore and deeper water, the spokesman added.

Meanwhile, ONGC, the spokesman said, has got experience in drilling in deep waters in the East Coast where the deepest well drilled was at about a water depth of 482 metres and oil and gas found in structures G-1 and G-2.

Although exploration activities in deep water is expensive, the research and development efforts of ONGC in the recent past have given rise to encouraging expectation. Strategic like sub-sea completion and early production system adopted by ONGC have paid rich dividend, the spokesman said. Semi-submersibles have been designed to operate in depths of 1525 metres, steel rigs capable of operation in depth of 2080 metres with dynamic positioning and in depths of 400 metres with normal mooring system have also been designed.

Meanwhile the Union Government has cleared a research and development project involving Rs. 20.94 crores, the spokesman said.

ONGC SECURES EURO \$ LOAN ON BEST TERMS

The Oil and Natural Gas Commission (ONGC) has secured best terms ever for the \$300 million worth Euro loan raised by it recently. The 10-year loan at libor plus 3/16 per cent interest for first two years and thereafter libor plus 1/4 per cent interest with seven and half year grace period is considered the cheapest Euro dollar loan ever raised by any Indian borrower.

Prior to this, ONGC had raised \$575 million Euro loan in November 1986 which combined tax sparing facility with conventional loan. The size of the loan was increased from the original \$500 million following enthusiastic response from international banks. As many as 52 international banks had participated in this loan which was broken into three tranches, namely, a conventional libor tranche of \$325 million and Japanese and UK/Belgian tax spared tranches of \$175 million and \$75 million respectively and had a maturity period of 10 years with a grace period of five and half years.

Burma keen on oil expertise

Burma has evinced keen desire in sharing India's expertise in oil-related activities and pharmaceutical products.

The scope for enhancing bilateral ties between India and Burma was discussed in New Delhi recently when the visiting high-level Burmese delegation led by Mr. U. Khi Maung Gyi, Minister of Trade of Burma, called on the Finance and Commerce Minister, N.D. Tiwari. This was followed by official level discussions between the two sides.

A part of the delegation also had a meeting with the Chairman of the Oil and Natural Gas Commission, Col. S.P. Wahi. The meeting was also attended by the representatives of the Ministry of Petroleum and Natural Gas, Ministry of External Affairs, Department of Fertilisers, Gas Authority of India Ltd., and Engineers India Ltd.

Impressed by the ONGC's performance during the last few years and adoption of the latest state of art technology, the Burmese delegation evinced a keen desire in sharing the Commission's expertise in effective utilisation of natural gas through developing of suitable down stream facilities, use of enhanced oil recovery schemes from their existing fields, and drilling of directional wells.

Speaking on the occasion, Col. Wahi said that an Indian Consortium of Oil and Natural Gas (ICON) companies has recently been formed for taking up turnkey projects for all oil related activities in other countries with Hydrocarbons India Ltd. as its lead agency.

In his meeting with the Burmese delegation, Mr. Tiwari said there was vast potential for stepping up trade and economic co-operation between the two countries. He emphasised the need to expand and diversify India's exports to Burma for which there was considerable potential. He said the present level of trade with Burma was quite insignificant with total trade between the two countries in 1986-87 having amounting to only Rs. 34.62 crores out of which India's exports were only a meagre Rs. 73 lakhs.

Mr. Gyi expressed his country's interest in promoting greater technical and industrial ties with India and also the transfer of Indian technology to Burma.

The Burmese Minister said his delegation would try to identify specific areas of co-operation during the current visit and would follow it up with the concerned ministries and corporations in India.

During its fortnight-long visit, the Burmese delegation is expected to visit various industrial establishments in and around Delhi as well as in Bombay, Madras and Calcutta. The delegation is scheduled to have another round of discussions on its return to Delhi with the Ministers of Commerce and Industry.

ONGC TO STEP UP EXPLORATION IN RAJASTHAN

As part of the intensive exploration strategy chalked out for the western region, ONGC is intensifying its seismic exploration and exploratory drilling, with a stress on acquisition of better quality data by deploying the latest technology and improved field techniques.

The latest methodology of seismogeological analysis and geological modelling is being adopted, according to the Commission.

A sophisticated desert rig 760

manufactured indigenously by Bharat Heavy Electrical Ltd. at a cost of Rs. 9 crores has been inducted into the ONGC's fleet of rigs recently. It will shortly spud its first well at Ghotaru in Rajasthan.

Drilling in the hostile conditions of the Thar desert is a difficult and costly proposition by conventional rigs as it involves huge investments involving construction of roads and specialised transport equipment. Besides, the total drilling time which is a major factor in determining the expenditure on drilling would be substantially reduced as the time for transporting rigs is significantly curtailed from about 40 days in case of conventional rigs to about 2-3 days.

ONGC has proved two gas fields one at Manhera Tibba and another at Ghotaru so far. The recent oil show in Ghotaru well no. 2 have further brightened the oil prospects in Rajasthan. Another deep drilling rig 3D-17 has been deployed at Chotaru. During the current year 1987-88, it is planned to drill 7300 metres and complete 4 wells. Two more locations are available for drilling on the Ghotaru structure.

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Stable oil prices predicted

International oil prices are most \$ 18 level and threatened to go down likely to enjoy relative stability till the turn of the century with the price ranging between \$15 to \$20 a barrel if the current geopolitical conditions persist and no major crisis develops in the Middle East.

Predicting this, Prof. Peter Odell, a leading world authority on oil teaching at Erasmus University, the Netherlands, says that it will not be in the interests of either the Opec, the largest oil producing cartel in the world, or other major nations like USA or the UK to push up the prices or lower them as the period that will immediately follow will be one of major crisis.

Delivering a talk on "International oil market situation and prospects" under the joint auspices of the South Asia chapter of the Washington-based International Association of Energy Economists (IAEE) and Tata Energy Research Inst., Prof. Odell, a British citizen who heads a think tank on oil at the Centre for Energy Research at Rotterdam University, said after the discord in the Opec, recently over the selling prices, international prices slid by \$ two to \$ three a barrel from the

further.

But it was rescued by member countries in the Opec resorting to production cutbacks.

This amply demonstrates the concern each nation has in getting its share in the shrinking market especially in the developed market, Prof. Odell said.

Only relative price stability will enable the international companies to invest more in the sector and the present trend shows that the list of companies is increasing day by day. At present there are over 73 major companies producing oil in the world, he said.

Prof. Odell said if the oil shocks of 1975 and 1980 were to be repeated, when oil prices rose to a record high of \$ 30 a barrel, then the international market would just collapse because of stiff consumer resistance from nations burdened by huge import bills. Such nations would look for alternative sources of energy.

In fact, he said, in the developed world after the oil crisis in the late seventies, many developed countries shifted the emphasis from oil to

other sources of energy but developing countries either maintained or increased their dependence on oil.

If the other situation of over production and price crashes as the occurred in 1986 to a record low \$ 10 develops with prices falling low as \$ five US a barrel, then there would be excessive demand and international supply will just dry up, he said.

If this extraordinary situation develops half the oil industry in the world will have to close down, Prof. Odell said.

Such a situation would be immediately followed by an unprecedented rise in prices of oil which could go as high as \$ 50 a barrel, Prof. Odell said adding, no oil producing country in the world would be interested in facing such a prospect if it could help it.

Saudi Arabia and the people of USA will guide the oil market in the future. The Saudi King could decide if there should be production cutback or not and the US people the largest consumer of gasoline have to make up their minds to consume more or less.

Production of oil in the world has increased only steadily and not dramatically as the figure has gone up from 500 million tonnes in 1950 to only 4,000 million tonnes in a 30 years period till 1987. Prof. Odell said pointing out that generally the emphasis was shifting from oil to other sources of energy.

The most promising energy source of the future, he said, was compressed natural gas (CNG).

MAHARASHTRA SEEKS ROYALTY ON OIL, GAS

The govt. of Maharashtra has sought "royalty payment" from the Centre on oil and gas exploited from Bombay High and similar off-shore structures near Maharashtra. The plea for such royalty payment is made in the memorandum to the Ninth Finance Commission submitted by the government of Maharashtra.

The line that the state government proposes to pursue in the discussion on the Ninth Finance Commission, is that the "possession of external sovereignty by a country does not affect its federal structure, the division of internal sovereignty between the Centre and state governments being relevant for determining whether a Constitution is or is not federal".

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TRANSPEK SEMINAR ON :

Role of UV stabilizers in polymers

A one day seminar on the role of stabilizers in Polymers, was organised by M/s. Transpek Industry Ltd., on 22nd Dec. '87 at Hotel Marock at Bombay. Eminent plastics technologists and leading luminaries from the industry participated in the seminar.

Mr. Atul Shroff, Managing Director of Transpek, welcomed the guests. Prof. S. P. Potnis, Director University Department of Chemical Technology, Bombay delivered the inaugural address and Mr. Raman Patel, President of Bhor Industries delivered the keynote address. Four important technical papers of various aspects of U.V. Stabilisers were presented by experts.

In his welcome address, Mr. Atul Shroff gave a background of his company and said that the purpose of organising the seminar was to share the knowledge and various applications of U.V. Stabilisers with the participants.

Prof. Potnis in his inaugural address pointed out that the plastics and plastic products were seriously affected by the atmospheric radiation. U.V. radiation was a major deleterious factor for plastics. This affected the mechanical and physical properties of plastics. To protect plastics from this, use of ultra violet stabilizers had become necessary. He said that the current trend of using plastics in construction field replacing conventional materials like glass, ceramics, wood etc., had necessitated the protection of plastics used from UV radiation. Suitable additives were added in the processing of plastics so that they absorb UV light effectively, leaving the polymer intact. U.V. absorber should be able to dispose of the radiation without interacting with the structure of polymers. The first U.V. absorber used was a benzotriazo compound used in cellulose acetate. But the most important U.V. Stabiliser that came to be used were hydroxy benzoquinone derivatives. They were found to be effective due to their unique structure. A study was undertaken in the UDCT, of the properties of the benzoquinone and hydroxy benzoquinone.

Stressing upon the uses of U.V. stabiliser in plastics, Prof. Potnis said that these additives had become

necessary more and more due to varied uses of plastics in agriculture, management of water, distribution of water through pipes to longer distance exposed under direct sunlight. Looking into the increased use of such types of plastics, the need for developing suitable UV stabilisers to increase the life of plastics materials, components etc., had become all the more essential. In this context, Prof. Potnis was very happy to note that Transpek Industry had taken a right step in organising the seminar.

Keynote Address

Mr. Raman Patel, a doyen of the plastics industry, in his keynote address said that the plastics industry had arrived into the 21st century. "India is in the threshold of great developments in the plastics industry during the coming years," he said.

Mr. Patel said "During the last forty years or so when the plastic industry came into being in this country, the consumption was around 3/4 of a million tons. However by the year 2000, it is reckoned that the consumption is expected to shoot up to 3 million tons." Mr. Patel was happy to note that given the above scenerio, Transpek Industry had chosen in right time to organise a full day seminar on a very important subject concerning the plastic industry.

Giving an estimate of the consumption of plastics, Mr. Patel observed that various studies undertaken by different organisations, confirmed the figure of 2½ to 3 million tons of plastics which would be consumed by the year 2000 (LDPE around 840,000, HDPE 570,000, PVC 700,000, and others around 130,000). All these plastics would require large quantities of UV Stabilisers.

Mr. Patel guesstimated the use of plastic production in building applications was around 76,000 tonnes. By the year 89-90, around 200,000 tonnes would be used by the construction industry alone replacing wooden windows, bath room fittings etc. Hence development of suitable UV Stabilisers for protecting the products had become very necessary.

Mr. Patel exhorted the industry to interact suitably with the various research institutes so that fruitful

collaborations would result in a better product. He concluded his address with the remark "if at all any industry in this country had arrived, it is the plastics industry which is destined to play a big role".

Technical Papers

The following papers were presented and discussed at the seminar

- PhotoDegradation and Stabilization of Polyolefins, Dr. A.B. Mathur, CIPET Ahmedabad.
- The Vital Role of UV Stabiliser in Plastics, Prof. Dr. C.K. Patel, Sardar Patel University, Vallabh Vidyanagar.
- Ultra Violet Light Stabilisation of Polypropylene, Dr. B.O. Shah, Neomer Ltd., Vadodara.
- Project — UV, Dr. Mrs. E.G. Vaidya, U.D.C.T., Bombay.

Panel Discussions

There was a well-participated panel discussion on the topic. Many interesting points were brought out during the discussion.

About Transpek

Transpek Industry Ltd., which will be celebrating its Silver Jubilee in 1990 is a multifaceted company, manufacturing wide variety of products. Besides producing UV Stabilizers, the company is producing sodium hexametaphosphate, sodium hydro sulphite, thionyl chloride, sodium formaldehyde sulfoxylate, sulphur dioxide, sulphur dichloride, 2-hydroxy 4-methoxy benzophenone and 2-hydroxy 4-n-octoxy benzophenone.

Vote of Thanks

Mr. Paresh M. Saraiya, Vice President, Marketing and Development of Transpek Industry, proposed a hearty vote of thanks.

STRESS ON SLURRY TRANSPORTATION

The technology for transportation of minerals through slurry pipeline, now being developed in India, will help cut costs by upto 40 per cent and could in future be used even for semi-finished products like coke, alumina. Prof. P.K. Jena, director, Regional Research Laboratory, Bhubaneswar, said at Bhubaneswar.

Addressing the inaugural session of a three-day international symposium on "Hydraulic transportation of coal and other minerals," Prof Jena said work was being done on this technology for more than a decade at the RRL Bhubaneswar in collaboration with Engineers India

Ltd. based on the expertise and facilities developed at Bhubaneswar.

The symposium is being organised jointly by RRL, Bhubaneswar, and the Indian Institute of Metals.

Dr. L.R. Vaidyanathan, of the IIM, said slurry transportation had been identified by the Planning Commission as a thrust area of research in view of the rising volume and cost of coal transportation through rail and road, especially for the power sector. IIM proposed to hold a major programme on continuous casting of metals, he disclosed.

IIT COURSE ON SAFETY IN CHEMICAL UNITS

IIT Bombay is offering an elective course in the Chemical Engineering Department on 'Safety in Chemical Industry, for the current semester. It is believed that this is the first time such a course is being offered at any educational institute in India, according to a press release issued at Bombay.

The course content will include factors such as risk assessment, risk management, safety culture and techniques for tackling industrial disasters.

PAINT SEMINAR

Gujarat Paints and Allied Industries Federation has decided to organise a one-day seminar. Instead of highlighting the problems faced by the industry, this seminar will educate the Federation members about the latest research development and modern technology in the field of paints.

Talking to newsmen Mr. Suresh Patel, President of the Federation said that there was ample scope for paint industry in Gujarat if the State Government was willing to reduce sales tax.

He also informed that small scale paint industry in the State was facing an acute problem of supply of titanium dioxide and rosin. The Gujarat Small Industry Corporation has assured to make both these raw materials available to these units.

SEMINAR ON DIABETES THERAPY

A National Seminar on "Indigenous Drugs & Non-Durg Therapy" In Diabetes Mellitus will be held at Madras during March 4,5, 1988, sponsored

by Indian Holistic Medical Association, co-sponsored by southern chapter of Diabetic Association of India and Department of Diabetology, Government General Hospital, Madras. For further details, contact 'Indian Holistic Medical Association, Post Box No. 794, Egmore, Madras-600 008. Phone: 87998

UNIDO WORKSHOP ON RUBBER-BASED COMPOSITES. JAKARTA, FEBRUARY 1988

Technologists and engineers interested in rubber-based composites should not miss a Workshop in Indonesia this February. This will provide a unique opportunity to hear the latest technical and economic developments arising from three years' research on the production and use of such composites.

The Workshop will be held in Jakarta from 23 to 27 February 1988.

The three-year project concentrated on development work in four main areas: new blends of natural rubber with synthetic rubbers and plastics, including greatly improved thermoplastic natural rubber blends; new bearing designs for engineering applications, including the use of fabric laminates; the use of natural rubber bearings for protection of buildings against earthquake damage; and an entirely novel, very flexible rubber spring.

Results in all these areas will be discussed at the Workshop. The project has been funded via the United Nations Industrial Development Organization (UNIDO) by the Federal Republic of Germany, and carried out at the Tun Abdul Razak Laboratory of the Malaysian Rubber Research and Development Board (MRRDB) in the UK. MRRDB is a member of the International Rubber Research and Development Board (IRRDB), the sponsors of the project. Arrangements for the Workshop are being made by the Research Institute for Estate Crops at Bogor, Indonesia.

Participants will discuss papers by members of the project team and invited speakers; they will also be able to make some visits to the rubber industry in Java and to the Research Institute in Bogor.

Attendance is open, with no registration fee.

For more details contact: P.W. Allen, Secretary, International Rubber

Research & Development Board Chapel Building, Brickendonburg Hertford SG 138 NP.

CIL CHIEF LASHES OUT AT PRIVATE SECTOR

The Chairman of Coal India Ltd. (CIL), Mr. G.L. Tandon, has lashed out at the private sector for using the Government and the public sector as a whipping horse instead of making constructive suggestions to improve services and increase productivity.

"You have time to accuse us but no time to meet and discuss the specific issues involved," he told members of the Indian Merchants Chamber (IMC) recently obviously referring to IMC's reluctance to organise a meeting of its members earlier despite his willingness.

Mr. Tandon said: "We are investing huge sums to increase production. From 70 million tonnes at the time of nationalisation (of coal mines) the production has gone up to 158 million tonnes. Therefore, we cannot be accused of having let down at least as far as quantity is concerned."

On quality, the major complaint of all coal users, he said efforts are being made to at least make sure that the coal which left the pithead does not contain any "extraneous matter." However, nothing could be done about the high ash content unless industry wants the coal to be washed and agrees to pay for it.

But CIL cannot take responsibility for quality at destination. "A lot of extraneous matter gets added to the coal during its transportation in open railwagons." Also CIL cannot keep track of all the 257 loading points around the country, he added.

Furthermore, Mr. Tandon observed, coal grades with lower ash contents are being cornered for industry sectors which require them most. Coal of grades A and B, with ash content as low as 14 per cent, would be only 14 per cent of the total coal available in 1989-90. That is why rationing has become essential.

He urged the IMC members to come forward with their specific problems so that appropriate measures to solve them could be taken. It was time industry stopped thinking about CIL as a monopoly agency with no concern for efficiency.

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Highlights in Chemical Technology (Part 1)

NEEDLE-LIKE TITANIUM DIOXIDE CRYSTALS WITH HIGH CONDUCTIVITY DEVELOPED IN JAPAN

Japanese company Ishihara Gyu Kaisha Ltd. has succeeded for the first time ever in developing needle-like crystalline titanium dioxide featuring high conductivity. The titanium dioxide crystals are as short as 3-4 micron in length. They are needle-shaped, which serve to increase conductivity because of the many contacts made when mixed in paints, plastics, etc.

Needle-crystal mixed products on which an ordinary conductor material is coated is reported to have conductivity about 1000 times that of conventional titanium dioxide-mixed products coated with a common conductive material.

The high conductivity helps to reduce the amount of titanium dioxide necessary for obtaining the required conductivity and this also reduces the adverse effect caused by the titanium dioxide mixture on the products in question such as paints, rubber and plastic.

The needle-like crystals are strong enough for mixing as well and they will find market for use in anti-static paints, plastics, rubber, fibers and recording paper. (*Japan Chem. Wk.* 3/5/87, p. 11).

A NEW FIBRE FOR CLOTH FROM PINEAPPLE

A Japanese textile firm Kanabo Co. has developed a cloth on a commercial scale from waste

pineapple fibres. This development was unveiled recently in Tokyo as a novel pineapple cloth. It was introduced in Tokyo as the fifth natural fibre after cotton, linen, silk and wool.

The new pineapple fibre is reported to have good water absorption (similar to cotton); but stronger than cotton, easy to dry. It has a texture described as somewhere between cotton and linen and can be easily woven together with other materials. India being a leading pineapple producer should look with interest towards this new technology from Japan.

CYCLODEXTRIN A NEW AGENT FOR COMPLEXING PESTICIDES

One of the valuable characteristics of cyclodextrin is its ability to complex pesticides. This property is not yet exploited by pesticide manufacturers and formulators. Applying cyclodextrin in this manner provides several advantages, including greater stability for the pesticide, enabling easier and better formulation, reduced volatility and therefore fewer odour problems and increased solubility, wettability and bioavailability for products that are not normally soluble.

For other uses of cyclodextrin in pharmaceuticals and foods, refer J.S. Pagington's discussion in *Chemistry in Britain*, 1987, 23, 455-58. (*Chemtech*, 9/1987, p. 610).

USSR INAUGURATES WORLD'S LARGEST ETHOXYLATION PLANT

Pressindustria Engineering & Plants SpA (Milan, Italy) has recently

started up near Moscow (USSR) what is being called the world's largest ethoxylation plant for the production of non-ionic surfactants (ethoxylated alkylphenols). It has a capacity of 25,000 tonnes/year. The complex was built for V/O Techmashimport, Moscow under contract to the Soviet Union's Ministry of Oil Processing & Petrochemicals.

Based on proprietary Pressindustria technology, the facility consists of several stages. First, there is a continuous film evaporator, where alkyl phenol is catalysed and dehydrated. This operation is followed by three ethoxylation units (in parallel), each with a batch capacity of 20-25 tonnes of ethoxylated alkylphenol. Finally, the plant has a continuous neutralization unit. The Italian firm reports that the process operates under mild conditions -- the pressure is about 3 atms. and the temperature is between 165°C and 180°C.

The products are to be used mainly for enhanced oil recovery in oil wells situated in tight formations. Some minor applications as detergents are also anticipated. (*McGraw Hill World News*, (Milan)).

HYALURONIC ACID POISED FOR GROWTH IN PHARMACEUTICAL AND MEDICAL FIELD

Current uses for hyaluronic acid (HA) are in ophthalmic surgery, where HA is used to replace the eye's aqueous tumour during cataract surgery and intra-ocular lens implantation. HA is also approved for veterinary uses specifically for orthopedic treatment of race horses. The acid's ability to absorb many times its weight in water has made

it appealing to the cosmetic industry as a moisturizing agent. Potential future applications for HA are in orthopedics, wound care, drug delivery systems, soft tissue augmentation and cardio vascular surgery.

Recently Genzyme has finalized an agreement with Hoffman La Roche to develop HA-based products for possible drug-delivery systems. A similar agreement has been also signed with Howmedica (a Pfizer subsidiary) to produce HA-based products for use on orthopedic surgery, an area with an estimated sales potential of \$400 million.

Charles H. Kline & Co. projects the world market for HA at \$200 million by 1990 AD. \$150 million for eye surgery, \$10 million for cosmetics and \$40 million for other uses, including wound healing, drug delivery and joint diseases. (*CMR*, 7/27/87, pp. 17-18).

A NEW MACHINABLE MICA/CARDIERITE-BASED CERAMIC DEVELOPED BY GIRIN

Government Industrial Research Institute, (GIRIN), Nagoya, Japan, associated to MITI, recently developed a new mica-cardierite-based machinable ceramic.

The new ceramic is excellent in terms of flexural strength and coefficient of thermal expansion. It can prove an economical ceramic.

The product is a kind of composite ceramic obtained by mixing gold, fluoromica, cordierite, barium fluoride and alumina and sintering them at a temperature of 1,350°C. Having a good machinability, it can be drilled and cut like a metal. Its thermal coefficient of expansion is 9.7×10^{-6} per °C, which is superior to those of available mica-based products since the product uses cor-

dierite and gold fluoromica (particle diameter is relatively large at 44µ) which are obtainable at low prices. (*Japan Chem. Wk.*, 4/1/87, p. 5).

A NEW COPPER-BASED SHAPE MEMORY ALLOY DEVELOPED BY KOBE STEEL

Kobe Steel Ltd. (Japan) has recently unveiled a new copper-based shape-memory alloy. This alloy is of a new type with nickel, aluminium, manganese and titanium applied to copper, the base material.

The new alloy is active at a high temperature of 100°C. At present the company is negotiating with automobile parts manufacturers in the USA. It has already delivered a total of 200 kg. of plate material of the alloy having a thickness of 1.2 mm to automobile parts manufacturers in USA. (*Japan Chem. Week*, 4/9/87, p. 5).

WORLD'S FIRST PLASTIC MADE FROM CYCLODEXTRIN IN JAPAN

C. Itoh Plastic System Co. in Japan is engaged in doing research on producing Cyclodextrin-based products. Cyclodextrin is produced commercially in Japan by Nihon Shouhin Kako Co. Recently, C. Itoh Plastic System together with Japan Liquid Crystal Co. has recently produced plastic based on cyclodextrin (CD). C. Itoh Plastic System will market this new plastic. The above two companies are the first in the world to produce and commercialise plastics from CD.

C. Itoh Plastic System will produce CD-applied products and market most of them. In Japan Liquid Crystal will undertake basic research and development of the target products. The former has already installed 20 tonnes/month production facilities. It envisages selling the product to

plastics, paper and fine chemical industries. The sales target for the initial year is set at 300 million yen. Potential applications include insecticides containing agricultural use films, perfumery containing sheet textiles and injection moldings, a fungicide and anti-mold containing wall paper. (*Japan Chem. Wk.* 4/9/87, p. 3).

CELLCA -- A NEW CELLULOSE FIBRE FROM FINLAND

Kamira Oy Saten in conjunction with another Finnish company Neste Oy is looking to expand production of their new cellulosic fiber called 'Cellca' to the non-woven industry. The Cellca fiber resembles viscose in many respects, but the cellulose carbamate process is stable and can be manufactured in economical optimum units for distribution to customers.

For the non-woven industry, the Cellca fiber (unveiled last April at Geneva INDEX-87) offer most benefits in the web laid area due to the unique binding properties of the fibers. A web may be formed on a paper machine without use of binders; Cellca fibers may also be used in blends with viscose or other fibres.

Neste has worked on a pilot scale for the past two years, with Kemira Oy Saten providing the fiber spinning. The companies are looking for associates for developing semi-commercial plant. (*Nonwoven Ind.* 5/1987, p. 14).

ASAHI CHEMICAL INDUSTRY PLANS FOR MASS PRODUCTION OF METHACRYLATE-BASED OPTICAL FIBRE IN FISCAL 1988

Asahi Chemical Industry Co. has finalized the project for mass production of methacrylate-based optical fibre, which it has been producing so far on a semi commercial scale (with

50,000 km/yr capacity). The capacity of the planned new facility not be less than 500,000 km/yr (in terms of 0.5 diameter fibre).

Ishihara's plastic based optical fibres are based on technology developed by Nippon Telephone & Telegraph Corporation. The fibres central part is made of polymethylmethacrylate, which is coated with methacrylic chloride.

Its thermal resistance is on a moderate level of 80-85°C, but it has excellent light transmission property. It can transmit a clear image over a distance of more than 100 metres.

The market for this optical fibre will be mainly for use in communication equipment and systems such as image guide and supplementary cables. (*Japan Chem. Wk.*, 4/9/87, p. 1).

WORLD'S LARGEST SYNTHETIC RUTILE PLANT COMING UP IN AUSTRALIA IN 1988

The world's largest synthetic rutile plant is under construction at Capel, Western Australia. The plant in the last phase of its completion was constructed at a cost of around 7000 million yens with multinational collaboration of Ishihara Sangyo Kaisha Ltd. (Japan), Tioxide International (Britain) and Westralian Sands Ltd. (Australia). The plant is slated to go into commercial production in May 1988. The region around Capel (W. Australia) is blessed with abundant ilmenite resources. Synthetic rutile is produced from this material using an intensified reduction extraction process. Ilmenite has a titanium dioxide content of 50%. The corresponding figure for synthetic rutile is above 93%.

Synthetic rutile is used as raw material for chloride process for pro-

duction of titanium metal and titanium dioxide. Rutile is in short supply worldwide. The earlier sulfide process is progressively replaced by the chloride process in USA and Western Europe, since the former leaves behind large amounts of waste materials. The new plant will endeavour to meet the rising demand for rutile.

The new plant will also help Ishihara Sangyo Kaisha to produce titanium dioxide in Japan and Australia. The company is Japan's only producer of titanium dioxide employing the chloride process (annual output: 36,000 tons). It also has a synthetic rutile plant in Japan.

It originally planned to build the synthetic rutile plant in Australia on its own, but eventually teamed up with the British company on the basis of their common interest in procuring synthetic rutile. They have taken 15 and 36%, respectively, of the shares in the Australian company. (*Jap. Chem. Wk.*, 4/2/87, p. 8).

THE WORLD'S LARGEST CUBIC SINGLE CRYSTAL OF BORON NITRIDE PRODUCED BY THE NATIONAL INSTITUTE FOR RESEARCH ON INORGANIC MATERIALS (JAPAN)

The National Institute for Research on Inorganic Materials (Japan) has succeeded in producing the world's largest cubic single crystal of boron nitride (CBN) having a maximum width of 3 mm and thickness of 1 mm. The crystal was produced after establishing the optimum conditions required by means of extensive experimentation. It was formed in about 30 hours at pressure of about 55 Kg and temperature of about 1700°C.

The crystal is reported to have excellent electrical and physical properties, such as conductivity,

thermal conductivity and hardness, which are comparable with those of a diamond. Researchers foresee several applications in electronics for this crystal in future.

Cubic boron nitride is stable under high pressure and semi-stable under normal pressure. It does not occur in nature. Since its synthesis 30 years ago, researchers have not succeeded in forming a crystal measuring more than 0.5 mm. Therefore, it has not been examined precisely and its properties are not well understood as yet.

The crystal was obtained in such a way that CBN powder dissolved into a specially prepared solvent at high temperature was separated onto a CBN seed crystal set at low temperature to form a crystal thereupon. (*Japan Chem. Wk.*, 9/2/87, p. 5).

PAINT EMITTING FAR INFRA-RED RAYS DEVELOPED IN JAPAN

Ube Industries Ltd. (Japan) recently developed and marketed a new version of its high temperature resistant paint (TYRANNO COAT), which is capable of efficiently emitting far infra-red rays.

The new paint marketed under the trade name 'TYRANNO COAT UT-100' was made by mixing a TYRANNO COAT material (poly titanocarbo-silane) and a specially prepared ceramic. When heat is applied to the paint, it gives off far infra-red rays having a wave-length of between 2.5 and 25 microns at a radiation efficiency of as high as 0.97.

The company reports that the above wave-length range covers that of 8-14 microns which the human body can absorb to the greatest extent. It also contains no harmful substance and so is ideal for use in health-care equipments and

dryers for foodstuffs, wood etc. The paint can maintain high radiation efficiency in a wide temperature range from room temperature to around 600°C. It is easily coated in metals, ceramics and plastics and has high temperature and corrosion resistances. (*Japan Chem. Wk.*, 4/2/87, p. 5).

ALMA (ALUSUISSE ITALIA MALEIC ANHYDRIDE) FLUIDIZED BED TECHNOLOGY FOR MALEIC ANHYDRIDE TO BE COMMERCIALISED IN JAPAN

Alma (Alusuisse Italia Maleic Anhydride) Fluidized Bed Technology for maleic anhydride will see its first commercialization in Japan by Shin Daikyowa electrochemical Co. (SDPC). The Japanese company's willingness to proceed with a first-of-a-kind plant was based on the demonstration level already achieved. SDPC's selection of the Alma process was based on its substantial economic advantages over other technologies. The decision was reinforced by the recognition that, as a new technology the Alma process has the potential for future improvements in contrast with older processes, which have already

reached their peaks. The Alma process has been developed by Alusuisse Italia in co-operation with Lummus Crest.

Shin Daikyowa Petrochemical Co. has initiated a project to build a 15,000 ton/year maleic anhydride plant at Yokkaichi, Japan, based on Alma process with n-butane as feedstock and solvent recovery of maleic in a continuous process in what will be the first full-scale plant for the new process. Start up is scheduled for late 1988. (*ECN*, 10/26/87, p. 30).

A METHANOL RUN SOLAR-POWERED REFRIGERATOR UNVEILED IN FRANCE

A solar-powered refrigerator developed by France's Brisonneau et Lotz Marine (Nantes, France) relies on the heating and cooling of methanol rather than solar-driven direct current to keep it cool. The cooling cycle begins after sunset, when a container of activated charcoal, functioning as a vacuum pump, adsorbs methanol from a reservoir, causing the methanol to evaporate and cool. During the day the cycle reverses, solar energy heats the

charcoal driving off the methanol as a vapour. The vapour condenses and collects in the reservoir where it is used that night during the cooling cycle.

The cooling section is 200 litres and maintains a constant temperature below 47°F. The system has no moving parts, which makes it ideal for remote locations. Refrigerated warehouses also can be constructed by combining multiple refrigeration units, topped with solar panels. A single refrigerator costs about \$3,000. (*Chem. Wk.*, 11/11/87, p. 50).

In brief. . .

Yamanouchi Pharmaceutical plans to market its psychotropic drug indelexozine (Elen) this year.

The drug which will be used to treat symptoms of mental disorders stemming from cerebral arteriosclerosis and postapoplectic disorders, is expected to become a flagship product of the company within the next few years.

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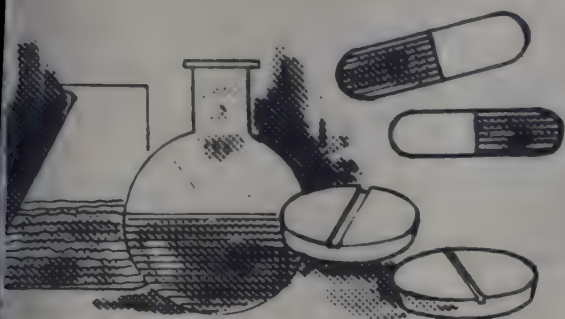
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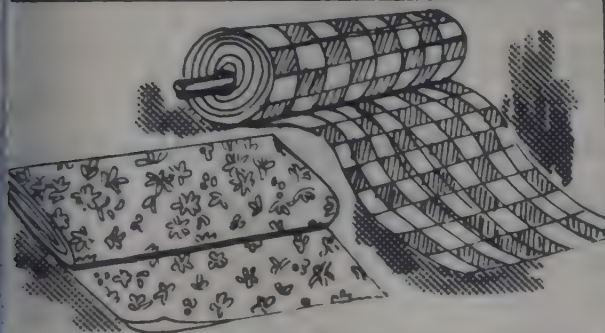
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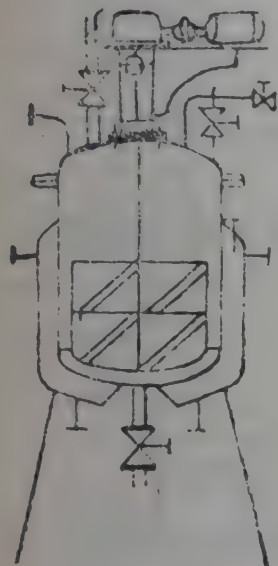
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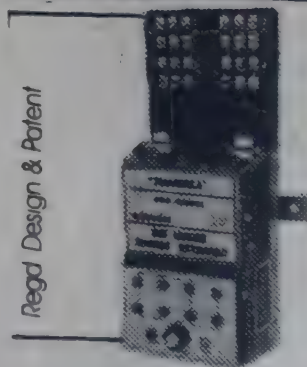
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Natural Rubber in Anti-Corrosive Linings of Chemical Plant

J.S. PITMAN

FPRI, Lining Consultant

(Reproduced from *Rubber Developments* Vol. 40, No. 1)

Natural Rubber's chemical resistance has been used in the past 130 years to protect substrates against attack. The first recorded mention of such use is in Thomas Hancock's personal narrative entitled *Origin and Progress of the Caoutchouc or India Rubber Manufacture in England*(1). In his summary, Hancock describes sheets of a mixture of natural rubber and pitch for the protection of ships' hulls and also mentions vulcanized sheet rubber for use as linings in chemical vessels.

The excellent chemical resistance of ebonite as a lining material was recognized at this time and patents for ebonite lining were applied for in 1874 by Thomas and Watson in Great Britain. In 1885, Locollange in France was granted a patent for an ebonite underlay with soft rubber on the exposed surface for lining chemical plant items(2). Up to the early 1920s, soft rubber linings were normally backed with ebonite for bonding purposes, but in 1924 B.F. Goodrich introduced their *Vulcalock* bonding system which enabled soft natural rubber linings to be bonded directly to metal substrates(3).

Rubber linings help make many processes in the chemical industry cost effective. Some of the most significant uses of such linings are in the processing of heavy chemicals, in dyestuffs manufacture, electroplating (including electrowinning of elemental metals) and anodizing, in water and effluent treatment and in pharmaceuticals/foodstuffs (predominantly in the demineralization of water). Other major uses of rubber linings include fertilizer manufacture, especially the production of phosphoric acid from phosphate rock, ore extraction and purification, and processes in the steel and associated industries.

Whilst synthetic elastomers have increased in use in rubber linings since 1950, it is estimated that approximately 85 per cent of linings worldwide are based on natural rubber. Approximately two thirds of the natural rubber used is as soft rubber linings, the rest being ebonites. Such a large share of the market is a result of the outstanding chemical resistance of natural rubber linings and this, coupled with the competitive price of the polymer and its relative ease of use, indicates natural rubber's continued predominance in this application.

Rubber linings are normally used to protect the substrate from chemical and/or abrasive attack or to protect the contents from contamination by the substrate, especially in the case of demineralized water. Often a combination of these two features is necessary. In some situations an exposed lining would not have an acceptable life span because the chemical, or more often temperature or abrasive conditions, are too harsh. Here a rubber lining may be employed in conjunction with a resistant brick lining, the rubber being used as a membrane under one or more layers of brick.

Rubber linings may be applied in a factory or on site, depending on requirements. With modern technology it is quite practical to line very large tanks on site: in such cases self-vulcanizing or 'chemical cure' linings are often employed.

Formulations have to provide maximum chemical and temperature resistance and also be suitable for manufacture of the sheet (by calendaring or roller die) and for application to substrates. All compounding ingredients should be resistant to leaching, with maximum chemical resistance. Fillers, especially naturally occurring ones such as clays, talcs, etc. have to be carefully selected. Ideally carbon black would always be preferred, both as a reinforcing agent and as a filler. The type of carbon black and the percentage used in the compound is, however, limited by the need to produce a lining with adequate electrical resistance so that it may be spark tested to ensure freedom from leaks. Leaching resistance is an important criterion when selecting accelerators, plasticizers and antioxidants, and especially when antioxidants have to be employed.

Except for ebonites, materials which can be vulcanized at ambient temperature and the special variations of abrasion-resistant compounds, it is best to use compounds which can be vulcanized both in an autoclave at temperatures up to 150°C, and on site at 100°C, using steam at ambient pressure or hotwater. Formulation 1 in the table is a typical dual-purpose material.

Apart from the development of special ebonites for particular end uses and the employment of more modern ingredients, little alteration to formulations has been

Table 1
FORMULATIONS FOR NATURAL RUBBER LININGS

	Formulations				
	1	2	3	4	5
	parts by weight				
	General Soft	purpose Ebonite	Site- Vulcanizing Ebonite	Chemical cure	Self- Vulcanizing Soft
Natural Rubber	100.00	100.00	100.00	100.00	100.00
FEF Carbon Black	25.00				
MT Carbon Black		1.00	3.00		
GPF Carbon Black				40.00	40.00
Ebonite dust		50.00			
Barytes	50.00	50.00			
Clay	70.00	50.00	50.00		40.00
Dark factice			10.00	10.00	
Zinc oxide	3.00		5.00	5.00	5.00
Stearic acid	1.00		1.00	1.00	1.00
Lime		2.00			
Process oil	5.00	4.00	3.00		7.00
Caloxol CP2 ^a					2.00
Antioxidant	1.00			1.50	1.50
CBS	0.75				
TMTM	0.15				
DPG		0.50			
ZDEC			7.00		
Dibenzylamine				2.00	
TMTD				0.50	
PPD					
Sulphur	2.50	37.00	40.00		0.60
MC Sulphur				2.00	2.00

a. Calcium oxide

required over the years. Usually two ebonites are employed, an autoclave-vulcanizing version for factory work and a highly accelerated material for vulcanizing on site using steam at ambient pressure. Site-lining ebonites, being heavily accelerated, are limited with respect to operational temperatures. When used at temperatures above 70°C, they tend to post-vulcanize leading to an increase in hardness and subsequent brittleness. Formulations 2 and 3 are typical lining ebonites.

One of the major problems encountered by the rubber lining industry has always been the requirement for vulcanizing lining on site, especially when operating on a 'green field' site, i.e. one with limited facilities. Traditionally, vulcanization has been accomplished by using steam at ambient pressure or boiling water. Two major difficulties can arise when using either of these methods. Firstly, a supply of steam has to be arranged. For very large tanks a steam supply of at least 2270 kg per hour

is required and this output is beyond the capability of many industrial sites. The supply of steam has to be continuous for periods of up to ten days.

Secondly, whilst vulcanizing temperatures may be reasonably easy to achieve in warm climates, in temperate areas such as northern Europe factors such as wind and rain may result in excessive heat losses. To combat this, either the steam supply has to be increased and/or vulcanization time has to be extended. Alternatively costly methods of external insulation must be employed. Naturally, vulcanization of lining at elevated temperature in large capacity tanks, especially those over seven metres in diameter, can significantly increase costs. Such costs can be excessive if climatic conditions necessitate extra steam supply or extended vulcanization time. Nevertheless, satisfactory vulcanization is essential since under-vulcanized linings will have inadequate chemical resistance.

In the past one method of minimizing the problems associated with on-site vulcanization has been to use 'chemical cure' technique, where the lining compound contains an amine activator and the surfaces of the rubber sheet are coated with a reagent to initiate ambient-temperature vulcanization. A typical system is detailed in Formulation 4. Dibenzylamine is incorporated in the mix as the activator and acidic ingredients are avoided where possible. Stearic acid is not an essential ingredient but if desired should be added in the form of zinc stearate. The rubber sheet is treated with carbon disulphide or a solution of a xanthogen disulphide in solvent to initiate vulcanization, and this can be done either before the lining is applied or after the lining is completed. The carbon disulphide or xanthogen disulphide permeates the rubber and combines with dibenzylamine to form ultra-fast dithiocarbamates in situ. Vulcanization then takes place rapidly at ambient temperatures.

'Chemical cure' systems are still widely used in some parts of the world but are unfortunately very hazardous due to the high flammability of the carbon disulphide or solvent used and the high toxicity of the chemicals involved. To overcome these problems, self-vulcanizing natural-rubber-based compounds have been introduced. Such compounds need to have a vulcanization rate curve similar to the one in Figure 1. This shows a slow initial rate of crosslink formation (i.e. delay of vulcanization initiation) followed by a rapidly increasing rate of crosslinking. After four to five weeks Wallace plasticity reaches 100 when a measurable hardness of 30 IRHD has been attained. After seven to eight weeks, hardness reaches an optimum of 60 IRHD.

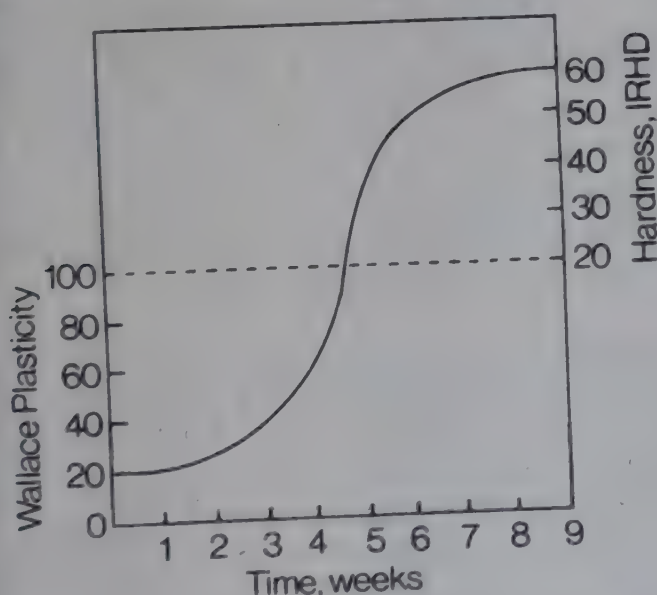


Figure 1

Vulcanization rate for a self-vulcanizing natural rubber

In practice such a compound allows sufficient time to apply the lining without the risk of 'set up' in adjacent

panels of rubber sheet, causing jointing problems. To arrest crosslink formation between manufacture of the lining and application to substrates, the sheet is stored at 0°C or lower.

A typical self-vulcanizing mix is shown in Formulation 5. This contains clay and carbon black as filler/reinforcement although, providing the requirement of sufficient electrical resistance for spark testing is met, then it is feasible to use carbon black only. Dithiocarbamates may be used as ultra-fast accelerators. The accelerator used in Formulation 5, piperidinium pentamethylene dithiocarbamate (PPD), gives a suitable increase in vulcanization rate, without being so fast as to give uncontrollable scorch conditions. The level of PPD used is variable, depending on the vulcanizing rate required, coupled with factory processing conditions (especially process temperatures). Other dithiocarbamates may be used but it is always necessary to consider the properties required of the lining.

To ensure that the crosslinking rate is achieved, the pH of the compound must be controlled, so that a slightly alkaline state is produced. This is achieved by adding calcium oxide in limited amounts. Excess calcium oxide has to be avoided otherwise the final chemical resistance of the vulcanized lining could be affected.

An interesting property exhibited by 'Chemical cure' and self-vulcanizing compounds is their extremely good resistance to ageing. For example, a self-vulcanizing compound aged in air at 70°C for four weeks will retain over 95 per cent of its original tensile strength and elongation at break. An equivalent compound vulcanized at high temperature would retain, at most 60 per cent of its properties over the same period. Therefore it is possible to produce linings with high resistance to ageing without employing high levels of antioxidants or anti-ozonants.

The ageing resistance exhibited by these materials is certainly due to the fact that ambient temperature vulcanization gives maximum cross-link density whereas high-temperature vulcanization leads to destruction of some of the crosslinks during the vulcanization cycle. This exceptional ageing resistance of 'Chemical cure' and self vulcanizing compounds is of benefit for linings of open top tanks and other lined items which are exposed to atmosphere. Even in conditions of high-temperature, sunlight and ozone such linings exhibit no signs of ageing over long periods.

It is a standard requirement of specifications that rubber linings must be bonded to the substrate they are

protecting. The new British Standard, BS6374: Part 5: 1985(4) requires a bond strength of at least 9 kg per 2.54cm wide strip and calls for separation of the lining itself rather than at the bond interface. Such bond strengths are easily attained in an autoclave, or when vulcanizing at 100°C, using proprietary primers and the correct tack solutions. The primers do, however, require vulcanization at elevated temperature to be effective, and are of little use when vulcanizing at ambient temperatures. Traditionally, primers based on chlorinated rubber have been used for bonding purposes with linings designed to be vulcanized at ambient temperature. Unfortunately, these primers have the disadvantage of being susceptible to disturbance by the solvents employed in tack solutions, thus giving variable results. The recent introduction of the new Chemlok priming systems, *Chemlok 281/282* or *Chemlok 283(5)*, have eliminated these problems, giving satisfactory bonding at ambient temperatures.

Tack solutions, used when applying the unvulcanized sheet to the substrate, have to demonstrate good 'green' strength, and on vulcanization must yield bond strengths higher than the tear strength of the rubber. Whilst it is possible to produce a tack solution based on the lining compound itself, it is preferable, especially with self-vulcanizing compounds, to make a specific solution compatible with the primer and the lining compound.

The manufacture of a lining includes compound manufacture, the production of the rubber sheet, the lining process, including preparation of the substrate, and vulcanization and inspection. After mix preparation, conversion to sheet is usually carried out by calendering in thin plies of upto 1mm thick. The individual plies are then combined on the calender to give a finished sheet, normally three to six millimetres thick. Modern practice is usually of continuous operation with the plies being built-up on a continuous belt linked to the calender.

Alternatively, sheets may be prepared using the roller die process, extrusion is also used to produce unvulcanized rubber tubes for lining pipes of up to about twenty centimetres internal diameter. Adequate cooling facilities are necessary, especially with self-vulcanizing compounds, so that the sheet is thoroughly cooled prior to packing. Unless self-vulcanizing compounds are for immediate use, they are quickly transferred to cold storage to arrest the onset of vulcanization.

The manufacture of self-vulcanizing sheet has to be carefully controlled, especially with regard to heat history. Poor control can lead to scorch problems and, whilst the accelerator level can be varied, there is a min-

imum level of 0.5 per cent, below which unsatisfactory and variable vulcanization rates will result.

An essential requirement for rubber lining is that the substrate surface is prepared to a satisfactory condition. Steel surfaces are grit blasted with split iron shot or with basic slag or washed sand to remove all contaminants and give an active surface for bonding purposes. Concrete surfaces have to be smooth with no cavities or projections and are often screeded to produce a suitable finish. All laitance must be removed as it will affect bonding. BS6374: Part 5: 1985 nominates grit blasting as the preferred method of preparation: the concrete surface must be dry and water must not be able to permeate from the outside of the concrete. Primers are applied to the surface immediately after surface preparation is complete.

The rubber sheet is prepared by cutting to fit the substrate geometry, the edges of adjacent panels being bevelled to an angle of about 30°C so that the panels may be joined without trapping air. After preparation, the surface of the rubber sheet to be bonded and the primed metal surface are coated with the tack solution and allowed to dry until all solvent has evaporated. The prepared rubber sheet is then carefully positioned on the substrate and rolled down, taking care to avoid trapping air. It is essential that the lining sheet is not unduly stretched, especially when lining into corners. If the sheet is stretched, then it may recover during vulcanization and detach itself from the substrate.

Pipes upto 20 cm diameter may be lined with extruded tube, but larger diameter pipes are lined with tube prepared on a mandrel from sheet. After substrate preparation and application of the tack solution, the rubber tube is slid into the pipe and inflated with air to attach it loosely to the pipe wall. It may then be rolled firmly down using longhandled rollers. Alternatively, a rubber plug may be drawn slowly through the pipe to force the rubber against the pipe wall and expel any air lying between the rubber tube and the pipe wall.

Factory vulcanization is usually carried out in an autoclave using steam under pressure at temperatures up to 160°C, if the component is a suitable size. Alternatively, if the lined item is a pressure vessel of adequate pressure rating, all outlets can be sealed and it can be used as its own autoclave, usually at pressures up to 70 kPa. Elevated-temperature vulcanization at 100°C without an autoclave is usually carried out on site, employing steam at ambient pressure or boiling water. The vulcanization of self-vulcanizing or 'Chemical cure' linings is time/temperature dependent. When more rapid

vulcanization is necessary, hot air or preferably steam at ambient pressure may be employed.

Quality control on all materials for rubber lining is essential. Good dispersion of ingredients, especially sulphur, must be attained and, with self vulcanizing rubber linings, monitoring of vulcanization rate for samples from each roll of rubber sheet must be carried out to ensure consistent material. A critical aspect of rubber linings, especially with the advent of BS6374(4), is the requirement for thorough testing before putting units into service. It is essential that, in corrosive conditions, the lining has no faults which could lead to substrate attack. Apart from the high cost of rectification or replacement of a damaged unit, escape of highly corrosive contents can cause serious damage and are extremely hazardous to plant personnel.

All substrate surfaces are inspected after grit blasting and before lining to ensure that they are suitable for application of the protective material. Applied rubber linings are inspected both before and after vulcanization. Visual examination for flaws such as mechanical damage, cuts, blisters, lack of adhesion and poor jointing is carried out over the entire surface of the lining. Any defects are rectified in accordance with the requirements of BS6374: Part 5: 1985(4).

Unless test samples are produced alongside the lining, the only practical method of testing the state of vulcanization is by hardness testing with a hand meter. Hardness has to conform to the specified value within plus or minus 5°, with three hardness readings per sheet of rubber. Continuity testing for pinholes and other discontinuities is carried out before and after vulcanization. Testing is carried out with either high frequency

instruments, which are based on a Tesla coil generating a high frequency discharge, or a direct-current, high-voltage instrument. The voltages at which they discharge can be varied between 5,000V and 50,000V. When the probe of the instrument is passed over the surface of the lining, there is a corona discharge. If a fault exists in the lining on a substrate, the discharge concentrates at that point and the fault is located. Whilst the test is simple to operate, experienced operators are required to ensure that inspection is satisfactorily conducted. As there is no quantitative non-destructive test for assessing the strength of the bond between the lining and the substrate, it is normal to produce a test sample made from the lining material for subsequent laboratory testing.

Natural rubber-based linings enable many chemical industry processes to be carried out in a cost effective manner. It is normally expected that a rubber lining, assuming adequate maintenance inspection is carried out at regular intervals, will give a working life of over ten years in operation. Whilst competition from other elastomers and from plastics has had some effect on usage, natural rubber linings have maintained a large proportion of market use and there is no reason to believe this situation will change in the future.

References

1. Hancock, T., *Origin and progress of the caoutchouc of India-rubber manufacture in England*, Longman, 1857.
2. Buchan, S., *Rubber in chemical engineering*, BRMA/MRPRA, 1965.
3. B.F. Goodrich, Trade literature.
4. BS6374: Part 5: 1985, *Specification for lining with rubbers*, British Standards Institute, July 1985.
5. Lord Chemical Products, *Chemlok adhesive systems for the rubber lining industry*, ST 110-2015.

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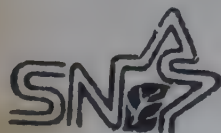
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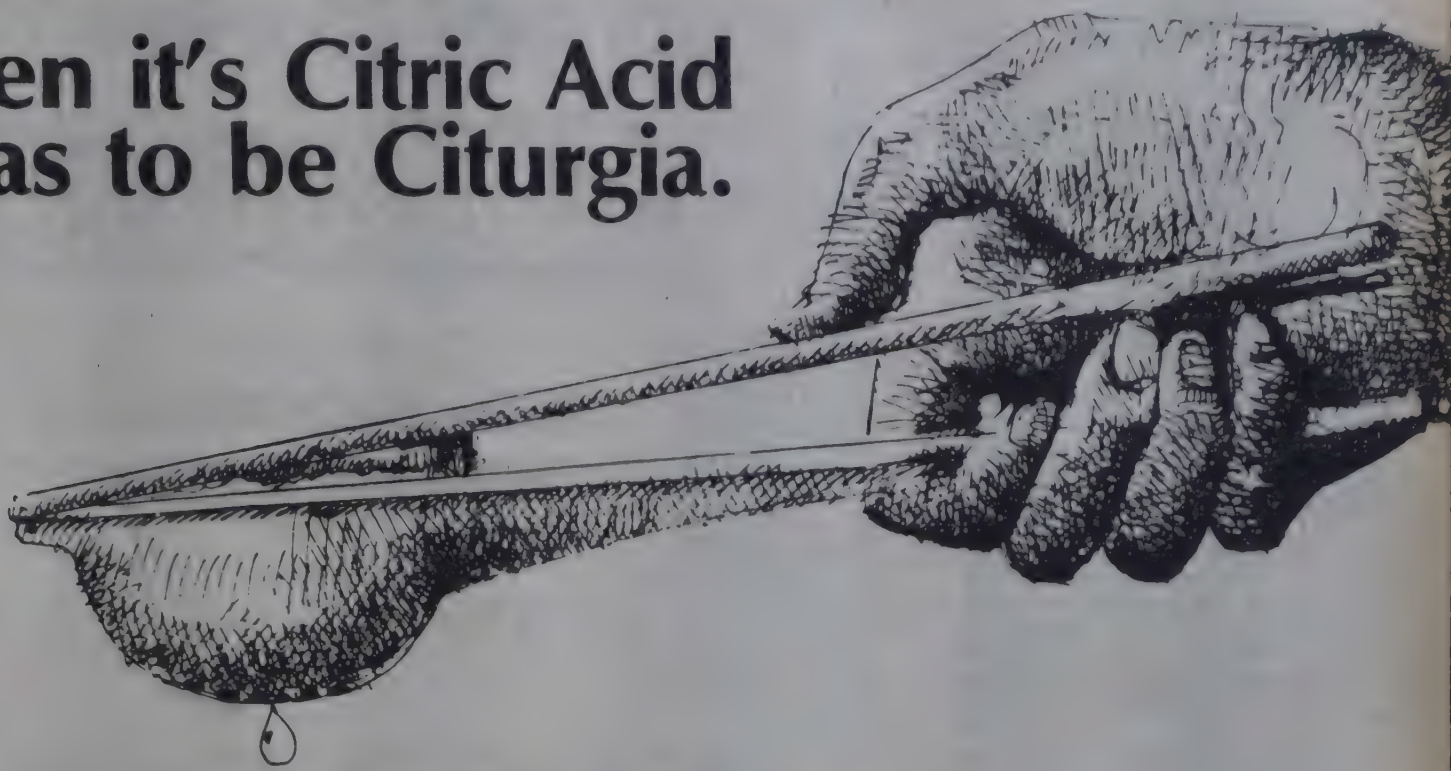
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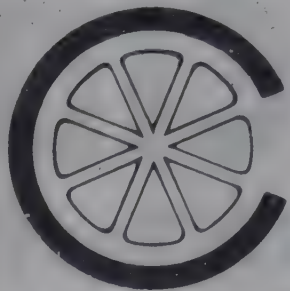
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News From Britain

SIGNIFICANT GAS FIND BY BRITISH FIRM IN PAPUA NEW GUINEA.

Gas discovered in significant quantities by British Petroleum (BP) in Papua New Guinea may be used to meet the power needs of mineral mines planned for the island's Southern Highlands.

BP, which announced the new gas find last week, provisionally estimates that reserves tapped by the Hides1 exploration well in Papua contains 43,000 million cubic metres of gas.

The Hides1 well, drilled last year, was targeted at the Toro sandstone formation in the Southern Highlands and reached a total depth of 3,385 metres. Four zones of the sandstone were successfully tested and showed the reservoir to be a prolific gas producer at this location.

Second well

Hides1 was the second well drilled in the area, the first having been abandoned dry in 1982 at a total depth of 2,986 metres. Following this failure, extensive geological fieldwork and a 125 km seismic programme carried out in 1986 led to the location of the Toro sandstone reservoir.

BP Petroleum Development Ltd. has a 95 per cent interest and is operator of the licence to explore the area containing the Hides1 well. It is also the sole licence holder of an exploration area to the north, and has interests in two other areas where discoveries have been made in recent years.

A BP spokesman said in London: "Preliminary discussions are cur-

rently being held with the Papua New Guinea Department of Minerals and Energy. These are exploring the possibility of utilising the Hides gas to generate electricity and meet the power needs of mineral mines planned for the Southern Highlands."

BRITOL MAKES INDONESIAN DEBUT AS OPERATOR

Britoil, the fourth largest producer of oil and gas in Britain, has become an operator for a large new exploration block in Indonesia for the first time.

The company has been made the sole interest holder in the Sula block, a 25,000 square kilometre area of Eastern Sulawesi, by Pertamina, the Indonesian State oil corporation.

Britoil's Sula work programme will require new seismic testing along a length of 3,500 kilometres and reprocessing of testing already carried out along another 1,500 kilometres. Drilling is expected to start in 1989, with two wells initially.

The company already holds three interests in Indonesia, but as a non operating partner, and drilling is expected to start in 1988.

One of the areas, the Kangean block in which Britoil has a 4 per cent interest, includes the Pagerungan gas field. Situated offshore east of Java, this field is thought to contain substantial reserves.

Britoil recently signed an agreement for the West Natrun concession in Egypt and has areas in Thailand, Ecuador, Dubai, Norway, the Netherlands, Denmark and the Republic of Ireland. It is also negotiating to obtain exploration areas in other countries.

IMPROVING FERTILISER QUALITY CONTROL

A new system developed specifically for continuous online analysis of fertiliser will be introduced to India by a British manufacturer of electronic controls for bulk production of agricultural fertilisers, visiting with the Birmingham Chamber of Commerce trade mission (9-19 January).

The J H Auto Analyser, from Howes Electrical and Automation Services, provides an analysis of a product within a minute of manufacture.

Quality control is improved, greater efficiency in the use of raw materials is attained, and the system will interface with most types of spectro analyser instruments. The equipment is self compensating for instrument drift. Analysis data can be transmitted to other computers for further processing.

Mr. Jack Howes, proprietor, will seek to finalise an agency agreement while in India.

For more information contact: Howes Electrical and Automation Services, 44 Fen Road, Wellingborough, Lincoln LN4 1AD, England.

COMPREHENSIVE IMPORTING SERVICE FROM BRITAIN.

A British company that deals with manufacturing industries, in particular the automotive, textile, chemical and engineering sectors, will seek Indian firms which wish to import from Britain, or which already do through a single buying or forwarding house, while on a trade mission organised by the Birmingham Chamber of Commerce from 9 to 19 January.

M and S (Midlands) Ltd., which will be represented by director Mrs. Janet Baker, has more than 30 years' experience in the field of procurement and forwarding.

"In addition to procurement, we can provide a total service," Mrs. Baker, who will be on her first visit to India, said in London. "This can include order progression, consolidation and warehousing in the case of multiple suppliers, case making and packing, letter of credit and banking services."

For more information: M and S (Midlands) Ltd., Monaco House, Bristol Street, Birmingham B5 7AS, England. Representative: Gordon Woodroffe Ltd., 36, Rajaji Salai, Post Box No. 42, Madras 600 001.

TOUGH AND FLEXIBLE PRESSURE HOSES FROM BRITAIN.

Flexible pressure hoses that withstand attacks from the environment and the substances running through them will be promoted in India during the trade mission mounted by the British and South Asian Trade Association from 26 January to 6 February.

Mrs. Christine Parkes, Export Sales Executive for Fliteline Ltd., of Slough, will seek additional agents for the 5000 series of pressure hoses that have proved as valuable in military applications as they have in those for railways and chemicals.

"A sophisticated new style inner-core construction offers real advantages over conventional types," explained Mrs. Parkes.

Continuous service

This convoluted PTFE innercore, with its glass fibre outer layer, gives continuous service at temperatures between minus 55 and plus 200

degree C. and remains unaffected by corrosives and potentially lethal substances. PTFE is nonflammable, odourless, chemically inert, imparts no taste, smell or colour to other substances and is completely resistant to fungus growth, it is claimed.

The outer braid is 321 stainless steel wire, closely woven to give a high pressure rating. Bores from 9.5 to 50 mm are available, and hoses twice as large can be supplied. The minimum bend radius of the smallest hose is 20 mm.

Flexibility is also a feature of the electrical conduit systems made by Fliteline, whose products have been used in aerospace and industrial robots.

Esterflex, a material used in their makeup, offers low temperature flexibility, good resistance to radiation and phosphate ester fluids, and is abrasion resistant.

"Our conduit systems thus have full electrical shielding and mechanical and environmental protection," said Mrs. Parkes.

For more information contact: Fliteline Ltd., 137-139 Farnham Road, Slough, Berkshire SL1 4BX, England. Agents: Dynamic (India) Pvt. Ltd., E40/7 Okhla Industrial Estate II, New Delhi 110020.

BRITISH FOOTWEAR FAIR IN MARCH

The second British Footwear Fair will be held at the National Exhibition Centre, Birmingham, from 13 to 15 March 1988. More than 200 exhibitors, including British manufacturers and importers and footwear companies from Europe, are expected to participate.

On display will be the latest in fashion, traditional, casual, sports,

specialist and industrial footwear. In addition, leather goods accessories, handbags and shoe care and cleaning products will also be on show.

Ideas for packing and display, stock control systems, footwear materials and components are some of the added attractions of this fair.

The first fair held last March at the same place was an unqualified success. The fair in March 1988 will be larger, having included other sectors of the industry such as materials and components.

BRITISH EXTRUSION EXPERT TO VISIT INDIA.

Techniques to extrude titanium and maraging steels have recently been developed by a British company visiting India with the Birmingham Chamber of Commerce trade mission from 9 to 19 January.

T.I. Hollow Extrusions Ltd., of Birmingham, is well experienced in the extrusion of aluminium and steel for the production of high precision components such as hydraulic cylinders and pressure vessels for the defence and industrial sectors.

The method can often reduce total costs, notably by eliminating some later operations due to the dimensional accuracy achieved by the process and by the avoidance of fabrication stages.

Mr. Fred Hopkins, Sales Executive, will represent the company on the trade mission.

For more information contact: T.I. Hollow Extrusions Ltd., Redfearn Road, Tyseley, Birmingham B11 2BW, England. Representative: T.I. and M., United Bank of India Building, Sir Pherozeshah Mehta Road, Bombay 400 001.

PLASTIC MOULDING MACHINES BUYER SOUGHT BY U.K. FIRM.

A British manufacturer of modular plastics moulding machines for teaching all methods of moulding in the rubber and plastics industries will seek distributors, or agents or a licensee while on a first visit to India from 9 to 19 January as a member of the trade mission from the Birmingham Chamber of Commerce. Mr. Anthony Mann, Managing Director of Fox and Offord Ltd., of Dudley, wants to meet plastics compression moulders, manufacturers of compression moulding presses, and visit schools, technical colleges and universities where engineering and plastics are taught.

Mr. Mann will introduce a precision pelleting machine for plastics compression moulders that has a number of advantages over its competitors. It is compact and mobile on built-in catering wheels. Die sets can be changed quickly only 15 minutes compared with up to half a day for competitive machines. Material savings of up to 75 per cent are claimed and compression moulding cycle time is said to be reduced. This machine is capable of pelleting many materials, including plastic powder for transfer and compression moulding, porcelain, powdered metals, chemicals, PTFE and catalysts. Pellet weight is constant to within 2 per cent. Cycle time for one pellet is as little as three seconds leading to reduced cycle times of following operations, it is claimed.

Modular moulding machines

Two modular moulding machines, claimed to be the only ones of their kind, will also be introduced. The "Polylab" is a bench mounted universal moulding machine of modular design for use in schools, technical colleges and universities. Not only

can it be used with appropriate process modules for moulding by injection, compression, transfer, extrusion or blow methods, it can also demonstrate vacuum forming without the need for an external vacuum pump. Further, using special test modules and appropriate moulds, the machine can be used to make comparison tests of tensile strength, shear strength and cross break strength. A comprehensive instruction manual, which is provided, suggests demonstrations and experiments as well as explaining the operation of the machine. "Unimoulder" is a floorstanding machine capable of similar performance to that of the Polylab.

Both machines can be supplied with unit test modules covers and ISO specimens to give standard test comparability. They are hydraulically actuated and manually operated. The "Unimoulder", however, can be either supplied as a powered unit or may be converted to power operation at a later date. For more information: Fox and Offord Ltd., Thornleigh Trading Estate, Clee Road, Dudley DY2 8UE, West Midlands, England.

PETROLEUM WAX PRODUCTS FROM BRITAIN

Products with such diverse uses as keeping foods fresh or protecting aircraft tyres will be promoted in India during the trade mission organised by the British and South Asian Trade Association from 26th January to 6th February. Mr. John Hampson, Export Sales Manager, will be representing Astor Chemical Ltd., on the mission. The company's main raw materials are petroleum waxes that are expected from the lubricating oil fractions distilled or separated from crude oil. Because crude oil has totally different characteristics depending on its country of origin, many of the waxes have different

properties. They also come in many stages of processing, from slack to the fully finished paraffin and micro-crystalline variety.

Most modern equipment

Waxes from more than 30 refineries around the world are used to maintain continuity of supply and to make available all types needed by customers. Waxes, polymers, resins and chemicals for compounds are numbered in hundreds. Astor has installed the most modern equipment available in its factories, such as automatic metering and temperature control, that eliminate the possibility of blending errors. Products are supplied in the most convenient form for customers -- a liquid, slab, powder or pellet. The company, a member of Associated British Industries, was established in 1917. It exports to more than 40 countries, and overseas supplies represent 60 per cent of its market. Mr. Hampson previously visited India in 1985 and 1987. For more details contact: Astor Chemical Ltd., Tavistock Road, West Drayton, Middlesex UB7 7RA, England. Agents: Esbind Private Limited, 986, 25th Main Shreenagar, Bangalore 560 050.

TOTAL COMEBACK?

French Oil group total CFP may be considering a comeback in chemicals having virtually exited the business during major restructuring of the country's chemical industry in 1983. It pulled out of the fertilizers business in 1986 when it sold its stake in Cofaz, but has retained its industrial rubber subsidiary, Hutchinson and is a major producer of xylene isomers. President Francois Xavier Ortoli has indicated that his firm does not plan to move further into petrochemicals but aims to achieve internal growth through Hutchinson or via acquisitions in the fine chemicals sector.

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Chemical News From Abroad

HELL BIDS FOR STATE SHARE SINGAPORE COMPLEX

Shell International Chemical Company is bidding to buy the Singapore government's share in the Pulau Ayer Merbau petrochemical complex. The government owns a stake in five of the seven plants at the island complex. It appeared to express willingness to sell out last year under a general policy of privatization.

Shell already owns a 20 per cent stake in one of the companies ethylene oxide and glycols producer Ethylene Glycol (Singapore) Pte Ltd, in which the Singapore government has a 50 per cent stake.

The central ethylene cracker at the S\$2bn (\$1bn) complex is operated by the Petrochemicals Corporation of Singapore (PCS), owned half by the government and half by a Japanese consortium, led by Sumitomo. Both shareholders are currently considering how to respond to Shell's offer.

The government also owns 30 per cent of the Polyolefin Company, a producer of low density polyethylene and polypropylene; 30 per cent of Phillips Petroleum Singapore Chemicals, which manufactures high density polyethylene; and 20 per cent of Denka Singapore, which manufactures carbon black.

Acquisition of a major interest in the strategically located, export-oriented Singapore complex would be a major boost to Shell's international trading position and signals a strong commitment to the commodity chemicals sector.

The PCS cracker regarded as something of a white elephant when

it was first built in 1984 is expected to show slight profits for the first time in 1987 after losses of S\$18m in 1986 and S\$33m in 1984.

Last year ethylene production from the cracker, which is rated at 300 000 ton/year, reached some 390 000 ton, according to PCS managing director, M. Yokotsuka. This was achieved because the plant skipped its maintenance turnaround.

The unit, which also produced 190-200 000 ton of propylene, runs on naphtha and lpg. Part of the feedstock comes from Shell's nearby Singapore refinery.

All of the ethylene is used in downstream units and PCS imports further tonnages from Saudi Arabia and other sources to supply downstream needs. In contrast, however, there is a surplus of propylene from the cracker amounting to some 20-30 000 ton/year.

Yokotsuka confirmed that there have been discussions with potential investors for further downstream development on Pulau Ayer Merbau. "We have been making every effort to invite investors to our complex for the production of derivatives to give added value," he said. Potential investors would use surplus butadiene, propylene and benzene.

Two newcomers to the complex include Tetra Chemicals, an MTBE joint venture between PCS and the Japanese trading house C. Itoh. This unit has been in production since last June. The other, Ethoxylates Manufacturing, is a US Indonesian joint venture. Its S\$10m plant will be the only one of its kind in South East Asia, producing fatty alcohol ethoxylates. The unit is a venture between Albright and Wilson of the UK

(owned by Tenneco of the US) and PT Prime Inti Perkasa of Indonesia.

Demand for petrochemicals in the Singapore area has been generally buoyant and prices have risen. However the outlook for later in 1988 is more cautious and any international economic downturn would badly affect exports from the Singapore complex.

BASF IN LATEX DEAL

BASF is to acquire Polysar's latex division in a move to strengthen its position in the US market. The sale price is around Can\$500m. (\$385m), with completion expected in June 1988. The agreement is subject to regulatory approval.

Although BASF is one of the world's largest latex producers it only has a small site in the US, at Freeport, Texas. If the acquisition goes ahead, BASF will gain Polysar's 220 000 ton/year of latex manufacturing capacity. Polysar is one of the largest suppliers of high solids latices in North America. Last year the latex division increased sales by 4 per cent to Can\$323m. The company decided to sell its latex assets to reduce debt and strengthen its financial position.

VITA ACQUISITIONS

British Vita has acquired the European thermoplastics group Uniroyal Royalite from Uniroyal Plastics Co. for pounds 10.3m (\$18.5m). The group, with operations in Newbridge, Scotland and Milan, Italy, manufactures rigid and flexible engineering thermoplastic sheeting including ABS and specialized polymers used in a range of specialist applications.

Profits of Uniroyal Royalite are expected to reach around pound 1m in 1987 on sales of some pound 15m. British Vita has also expanded

its fibre processing operations through the purchase of Pennine Fibre, a UK group with sales topping pound 5m. The acquisitions will boost Vita's turnover by around pound 140m, a 50 per cent rise.

SANOFI WINS CONTROL OF A.H. ROBINS

Sanofi, the French pharmaceuticals subsidiary of Elf Aquitaine, has won the takeover battle for control of US drugs firm A H Robins. Other contenders included American Home Products and Rorer of the US.

The deal comprises a complicated financial process that has had to take into account that A H Robins is under Chapter 11 bankruptcy which it filed for in 1985 to protect itself from creditors following claims over the firm's Dalkon Shield contraceptive device.

Sanofi will acquire 58 per cent of Robins for \$600m through buying convertible preferred stock from the company itself rather than its shareholders and will provide a \$2.375bn credit line for a trust fund to settle the Dalkon Shield claim.

Last month, Judge Robert Merhige, the federal bankruptcy judge supervising Robins' operations, put the compensation ceiling for claims at \$2.475bn. Sanofi proposes to set up the trust through an initial cash payment of \$100m by Robins and its own letter of credit, which will be managed by Chemical Bank of New York.

The merger plan was submitted to the judge on January 6, 1988, and will take about a month to consider.

Under the terms of Sanofi's proposal, Robins will be merged with the French company's US affiliate Ceva Laboratories which has interests in the animal health sector.

Ceva will then change its name to A H Robins. The merger and payments to claimants will be spread over five years. Sanofi's payments under the trust fund will not begin until Robins emerges from Chapter 11, which could take up to 18 months. In addition, the amount and administration of the trust fund is likely to be disputed by the claimants.

Robins' shareholders could also object to the plan as they are being asked to keep their shares and hope that the company does well enough to pay out high dividends in future years.

Although Sanofi's president Rene Sautier said no promise had been made to keep the US company's current management, vice president Jean Francois Dehecq believes Robins has done well to improve turnover by around 67 per cent/year over the past 15 years despite its problems. The US company turned in net profit of \$82m on sales of \$5bn in 1986. Some 60 per cent of sales are in prescription drugs with the rest in consumer products.

Sautier says Sanofi's strong research base will enable Robins to expand its product portfolio while the French firm will acquire the US presence it has been seeking for some time. The deal, if successful, would lift Sanofi from 33rd place in the world league of pharmaceutical firms to 20th by 1995, in line with the Elf subsidiary's aims.

CdF SELLS LORILLEUX IN RETURN FOR STAKE IN COATES

In a deal valued at pound 56.8m (\$103.3m), the UK inks and synthetic resins producer Coates Brothers has agreed to acquire CdF Chimies Lorilleux ink subsidiary. As part of the agreement CdF Chimie will take a 33.4 per cent stake in the enlarged

Coates group and intends to raise this to 40.6 per cent. Boosting its stake is likely to cost CdF around pound 19m.

Following completion of the deal which is generally welcomed in the CdF camp, Coates will have total sales of some \$581m, and rank third among the world's leading ink manufacturers. BASF, with sales around \$820m, and Dainippon, with turnover close to \$730m, are the world's biggest inks producers.

CdF Chimie's decision to relinquish some control over Lorilleux comes as a surprise. The subsidiary had been considered one of the group's star performers.

Last week, however, Tchuruk explained that on its own Lorilleux lacked the "critical mass" necessary to compete with the world's leading inks producers. He views the link with Coates as a deeper commitment to the worldwide inks business.

Although Lorilleux has sales of FF1bn (\$180m), and claims 10 per cent of the total West European market, over 80 per cent of its turnover is in France. It has manufacturing facilities in France, Italy, Spain, Portugal, UK, Switzerland and Scandinavia. Lorilleux's profit after tax for 1987 is estimated at FF64bn (\$11.6m).

For Coates the deal with CdF offers considerable opportunity for expansion. The UK group's business has developed mainly in the UK and Commonwealth countries although it does have minor interests in both Europe and North America, two key markets. Forecasts for 1987 predict Coates will post profits after tax of pound 12.8m on sales of over pound 200m.

Along with geographic synergy, the link between Coates and CdF

is a complementary product portfolio. The main businesses of the group include printing inks, lithographic plates and chemicals, industrial surface coatings, synthetic resins and reprographic products for the electronics industry. Over 50 per cent of sales are derived from

Lorilleux, meanwhile, makes a full range of printing inks and specializes in liquid inks for flexible packaging and ultraviolet offset inks for folded cartons.

In a statement, Coates said of the deal: "The combination will constitute a powerful European printing ink group with significant interests in other parts of the world. This is expected to realize major benefits through interchange of technology, the ability jointly to devote a higher level of resource to product development, rationalization of manufacturing and distribution resources and the development of a broader based management organization."

Closer links between CdF and the UK group are also expected to lead to further cooperation in other business areas including surface coatings, resins, unsaturated polyester resins and can coatings.

The financial details of the deal between Coates and CdF Chimie are complex. Initially, CdF will have to buy back shares in Lorilleux which it sold to subsidiaries of Banque Paribas. This will cost the state-owned group FF80m. CdF will then sell the whole of Lorilleux's capital to Coates for pound 56.8m. The UK group will then merge with Lorilleux and issue shares equivalent to a 33.4 per cent stake to CdF. Finally, the French company will seek to raise its total stake in Coates to over 40 per cent by a partial bid for 10 per cent of the UK group's enlarged capital.

CdF Chimie has reorganized its chemical businesses under the banner of its Norsolor subsidiary. The move covers the French firm's petrochemical and speciality chemicals business.

The petrochemicals division will comprise intermediates, polyethylenes and polystyrenes, while the speciality chemicals division will include synthetic organic intermediates, speciality polymers, formulation products and tars.

Norsolor's industrial subsidiaries Altulor, Casolith and Stratinor in the polymers sector and Auraix and CSL in the formulation department will continue to market their respective products.

ROCHE BIDS \$4.2bn FOR STERLING DRUG

Swiss Pharmaceuticals major Hoffmann La Roche has launched a \$4.2bn bid for Sterling Drug of the US. If successful, the deal would give Roche a readymade foothold in the over the counter (OTC) drugs business, an area in which it is keen to expand. Roche had healthcare sales of around \$5.1bn in 1986 while Sterling's turnover in this sector was \$1.4bn, over 50 per cent of total sales.

Roche is offering Sterling shareholders \$72/share but, the US firm's shares had risen sharply to top the offer price and Sterling was said to be resisting the takeover attempt. One US analyst believed the price would be forced up to more than \$80/share before it would be considered but, if other companies enter the bid battle for Sterling, the final price may be far higher. West Germany's Bayer is a likely bidder.

In a letter to Sterling's chairman John Pietruski, his counterpart at Roche, Fritz Gerber, said that the

two companies' product lines were highly complementary. Gerber added that the R & D capabilities of the two firms were "likely to result in a close fit." He gave assurances that Sterlings' management would be kept in place.

A merger with Sterling would help Roche reduce its currency exposure. In its 1986 annual report, Roche blamed the strength of the Swiss franc against most currencies, but particularly the dollar, for a substantial decline in the Swiss franc value of the firm's turnover. In 1986 Roche reported US sales of SF2.75bn (\$2bn), about 35 per cent of total turnover and a decline in percentage terms on the previous three years.

Sterling's attractiveness is enhanced by its strong OTC portfolio which includes major products such as Bayer aspirin and Panadol painkillers. The OTC sector is estimated to be worth around \$10bn and said to be growing at 10 per cent/year in the US.

Research and development costs from a high proportion of drugs companies' spending and Roche would benefit from Sterling's R&D push into areas including cardiovascular agents, antibacterials and analgesics. Spending reached \$103m in 1986 and was set to rise around 15 per cent last year. The company reported net income of \$171.5m on sales of nearly \$2bn.

Roche filed offer documents with the US securities and exchange commission last week. The offer is the largest takeover bid to date in the world pharmaceutical industry. It may herald the onset of a number of major takeover attempts by European firms anxious to gain a foothold in the US and lured by relatively cheap price tags because of a combination of the weak dollar and the stockmarket crash.

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Chemical Market Abroad

FAR EAST STYRENE DEMAND SETS WORLD SPOT PRICES

After a period of relative stability, styrene prices throughout the world are on the move again, buoyed by continuing surge in demand from downstream businesses particularly in the Far East and sustained tightness in the global market.

Styrene had a mixed 1987 and prices fluctuated dramatically throughout the year, peaking in mid November before falling back slightly at the year end with the seasonal lull in trading. Throughout the Christmas holiday, prices have remained steady on the Rotterdam spot market due to limited interest, even though prompt product remains available.

However, a recent increase in demand from derivative producers in Taiwan has sent prices on the US Gulf spot market which had been steady at 55 cents/pound (\$1212/ton) rocketing to 58-59 cents/pound (\$1278-1300/ton). Although there is precious little business being concluded in Rotterdam at the moment, price ideas have been revised upwards with T1 now at \$1240-1260/ton. One deal was heard for a small quantity in the distribution market at \$1320/ton for T2 material has been similarly revised upwards to \$1280-1310/ton.

Spot business has remained thin as all European styrene capacity is reported to be running without problems and buyers are getting sufficient product. The position is mirrored in the US where all but Arco and Amoco's units are running smoothly. Amoco's Texas City plant has been beset by problems for some time and Arco's Channelview

facility has been closed awaiting repair work which is expected to be finished by the beginning of Q2.

With a number of European producers expected to undergo maintenance turnarounds early in the year, including Atochem, Huls and Montedipe, the spot market is going to come under increasing pressure and sources predict that Europe could be poised for a major price explosion.

With styrene supply so close to consumption, consumers hoping to rely on imports from the US may be left short. The Far Eastern markets remain lucrative and T1 delivered prices in Europe are little above T2 levels, so US material is not expected to reach European shores until the picture changes.

As styrene spot prices remain healthy, observers are expecting this to be reflected in the first quarter contract, which many are predicting will top DM2300/ton, despite the fact that feedstock costs are falling and styrene margins are approaching 100 per cent. Producers seem unlikely to bow to pressure from downstream businesses to reduce the contract level, particularly as the major users are producers' own integrated PS businesses.

Competition in polystyrene has led to prices slipping back over the past few months and sources warn that a number of non integrated PS producers could be faced with closure as current prices barely cover styrene costs. But as demand forges ahead, producers will have the upper hand in the market for some time to come as no new styrene capacity is expected on stream before the end of 1989. In addition, there is little opportunity for further debottlenecking work.

BID TO END POTASH DISPUTE

The US Department of commerce and Canadian potash producers have set a target of January 8 for an agreement by producers "to make any necessary price revisions to eliminate completely the injurious effect of potash exports to the US".

Last August, the US commerce department recommended severe antidumping penalties against Canadian potash imports in response to complaints from high-cost US producers that product was being dumped at levels well below those prevailing on the domestic market.

The move sparked off a row between the two countries and William Devine, premier of Saskatchewan, Canada's primary potash producing region, threatened to embargo all potash shipments to the US. However, the Saskatchewan government instead introduced production quotas to curb potash output in a bid to drive up price levels.

If Canadian producers can satisfy US trade officials that measures to revise prices can be put in place, the commerce department will rescind the antidumping duties. So far, US importers of Canadian potash have been posting bonds to cover the duty.

The commerce department will also consult with the New Mexico producers Lundberg Industries and New Mexico Potash Corp which initiated the antidumping action. The companies' lawyer has indicated that they are "open to negotiating a settlement".

The recently signed free trade agreement between Canada and US was credited with having produced an environment favourable to sett-

ling the potash dispute. The agreement will gradually remove tariffs between the two countries over a 5-10 year period.

HAMM CHEMIE ENDS FERTILIZER PRODUCTION

West Germany's Hamm Chemie, a subsidiary of Norsk Hydro through its parent company Windmill International, is to cease fertilizer production by the end of March, but will continue to act as a sales outlet for fertilizers manufactured by Windmill and Norsk Hydro.

At the same time, managing director Hans Jurgen Nedtwig said Hamm will expand its overall trading activities and will rationalize production of basic chemicals at its production sites in Duisburg and Oberhausen.

Hamm, which was acquired by Windmill from Schering in 1983, said the "turbulence on international fertilizer markets" lost the firm a substantial chunk of its business in 1987 for the second consecutive year. The company said a decline in selling prices, due to "ruinous competition" had led to unspecified losses totaling millions of Deutschmarks and this could not be offset by good business in the other chemical product groups.

The Duisburg based chemical producer had sales of DM177m (\$108m), a slight improvement against 1986 (DM175m), but still considerably below the 1985 level of DM200m. The sales weakness was attributed solely to the weakness of fertilizer prices. Around 80 per cent of sales intake is from chemical trading, with around 20 per cent coming from production activities.

Following the shutdown of fertilizer production with the loss of 50 jobs, the company said it hoped to reach

the break-even point in 1988. Around DM2m is to be spent on upgrading chemical production at Oberhausen.

HIMONT TO MODIFY CANADIAN PP UNITS

Himont Canada is to modify a group of five idled reactors at its site at Varennes, Quebec to produce amorphous polypropylene for the first time in Canada.

The company originally used the units to produce crystalline homo and copolymer material until switching to the more flexible Spheripol technology. The units idled by the switch can also be used to make amorphous resin, used mainly as a hot melt adhesive in paper lamination and also in the roofing industry.

Capacity of the modified units will initially be 11,000 ton/year, and Himont expects around 90 per cent of the output will be exported, mainly to the US. The company says it is planning an "aggressive" marketing campaign to increase consumption of amorphous polypropylene in Canada. It predicts that domestic consumption will increase from a current level of 1,500 ton/year to 7,000-9,000 ton/year in the next decade.

NO EASING IN PE MARKETS EXPECTED BEFORE 1991

West Germany capacity for low density polyethylene (ldPE) remained nearly unchanged last year except for some retrofitting to provide new PE co and terpolymers.

Capacity additions were limited to low pressure linear low density polyethylene/high density polyethylene (lldPE/hdPE) swing capacities and these were mainly producing hdPE which provides higher unit returns than standard lldPE.

However, lower crude oil and the weak dollar have stimulated increased PE demand, causing ethylene shortage which has fuelled price increases. Capacity utilization has reached 90 per cent.

Speaking at the recent special plastics conference, Horst Maack consultant Maack Business Services noted that until further capacities installed, PE resin supplies will remain tight, although an easing of the present tightness is forecast for 1991.

Market outlets for ldPE homopolymers continue to decrease, the analyst notes, but high pressure functional PE co and terpolymers continue to find increasing applications. Demand for lldPE is continuing its double digit annual growth and product became short during 1987. Prices have been gradually increasing and Maack predicts this will continue in 1988.

The past overcapacity and poor profitability of the West European PE resin industry has prompted manufacturers to diversify. Several West European producers considered three alternatives to specialize their PE resin product range to generate higher profitability:

- Develop or license new catalyst technology to improve reactor yield and physical properties.
- Develop or license higher alpha-olefin copolymerization technology to produce lldPE, and
- Develop or license resin technology for polar comonomer groups or otherwise functionally modified ethylene co and terpolymers.

Whilst the average sales figures with most polyethylene manufacturers were low, particularly bad years were 1973-75 and 1979-82. The necessary return on investment did not allow for the building of new

modity PE plants all new capacities were either lldPE/hdPE swing reactors or high pressure retrofits for speciality co and terpolymers.

During 1985 Saudi Arabia, in joint ventures with Exxon, Mobil and Mitsubishi, began producing 690 000 ton/year of mainly standard C4lldPE and hdPE resins at significantly lower cost.

The effect of this excess of material on the West European market depressed prices of C4lldPE far below that of conventional ldPE and caused the withdrawal of lldPE producers and some sellers from the market.

Including several elderly PE reactors, the effective overcapacity in Western Europe reached some 1.5 m ton in 1984. By the end of 1987, several producers had mothballed PE reactors, cutting capacity to 900 000 ton.

However, Maack warns that capacity now again approaches a dangerously high utilization rate of about 90 per cent. At this rate, shortages of speciality resins are normally experienced. Towards 1991-1992, with further swing capacities of 420,000 tons not announced so far but expected by the industry, effective capacity available will mean lower utilization rates, and an easing in the supply of specialities, he said.

Despite early 1985 short term effects such as reactor damages and the cold weather, there was a reasonable balance between supply and demand in PE with capacity utilization at around 90 per cent. LdPE prices went from DM 1.60/kg to a high of DM 2.35/kg between January and June 1985, returning to DM 1.60/kg by November.

However, following the 1986 oil

price collapse and dollar devaluation, and also large Saudi lldPE quantities arriving in West Europe, prices eroded to DM1.05/kg by April 1986. Demand also fell drastically. During the second half of 1986 PE prices remained low, but profitability of the resin producers was high.

In 1987, firming crude oil and naphtha prices, coupled with higher polymer demand and low stocks, drove the first quarter 1987 ldPE prices up to DM1.35-1.40/kg. Butene-based lldPE overtook ldPE prices for the first time by about 5-10 Pfennigs. Q2 1987 PE prices continued to firm with further ethylene shortages. Q3 ldPE prices fluctuated around DM1.55/kg but finished the year at the DM1.80-1.85/kg mark.

Despite new lldPE capacities brought on stream by BP and DSM, West European lldPE resin prices continued to climb and stayed ahead of ldPE, even during the summer slow-down. Enichem's new lldPE/hdPE swing capacity started impacting the lldPE market in the last quarter of 1987. Also, Saudi lldPE products was far less available in early 1987, with imports restricted by tariffs and the relatively high cost of Saudi ethane-based production.

In the short term, polyethylene prices strongly reflect ethylene availability, rather than the crude oil price. During 1987, Western Europe's naphtha crackers were running flat out to cope with coincident shut-downs and accidents. These ethylene production restrictions led to further polyethylene price firming. This shift should continue gradually, unless crude oil increases above \$18-20/barrel.

During this period, higher quality functional PE copolymers, lldPE and vldPE resins have maintained a healthy premium over ldPE, and

they have not been subject to the same violent fluctuations.

During 1987 lldPE resins continued their penetration of ldPE markets, although at a slower rate than earlier predicted. Maack has revised predictions for year end 1987 West European demand at 655 000 ton (+18 per cent/year) to 592 000 ton (+14 per cent/year). This lower growth is based on two factors: firstly swing plants producing more profitable hdPE, and secondly the lldPE shortage causing standard lldPE resins to be higher priced than ldPE.

Whilst ldPE homopolymer consumption continues to decline steadily (about -2 per cent/year), functional ldPE co- and terpolymers are now more widely produced and thus have continued to increase at good rates (annual average down from +4 per cent in 1986 to +2 per cent/year in 1990).

The rapidly changing market events during 1987 have changed Maack's growth assumptions and predictions through 1992. The consultant predicts that the average annual growth of PE consumption in Western Europe (all polyethylenes) will be 1.8 per cent as previously forecasted. LdPE homopolymers will continue their downward slide by an average of -2 per cent/year, although this is being more than compensated for by the increase in lldPE, and also by increased production of speciality PE co- and terpolymers. Annual average growth rate is predicted to be just below 1 per cent for the combined tonnages of ldPE, lldPE and PE copolymers through to 1992.

Growth in consumption of lldPE, including vldPE and uldPE, will average 14 per cent/year over the same period, down from a previous prediction of average 18 per cent/year.

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In the European Market

Strong crude and weaker dollar levels have pushed naphtha prices to \$146-149/ton.

Ethylene prices have slipped to \$420-440/ton cif NWE with good supply and stocks slowly building up after the holiday break. With crackers operating at full capacity and no major hiccups in production prices could slip further in the next week. Products from Libya and Algeria is available but unlikely to be snapped up in Europe.

After dropping to \$330-345/ton for lots around 4000 ton propylene prices have steadied. Some deals are being done nearer DM600/ton.

Lack of business has left butadiene prices drifting down to \$550-570/ton. US levels too are low at 28 cents/pound and traders suggest product was over priced before Christmas.

First quarter contract negotiations are reported to be settling close to FF3 200/ton (DM946/ton), some way

short of last quarter's level. Benzene prices have recovered after slipping back and there is ample availability on the spot market with business at \$250-255/ton. Seller's price ideas are settling around \$260/ton. A first quarter contract of DM435/ton was concluded between Shell and BASF and has been accepted by the market.

Interest in toluene from the gasoline pool has steadied prices between \$200-210/ton with settlements heard at \$205/ton and \$207/ton for 1-2000 ton parcels. Q1 contract deals between DSM and Exxon have settled in the region \$190-195/ton and with Sun Canada and Texaco at \$190-200/ton. Traders are hoping for an upturn in the market with a continuing tightness in MTBE supplies.

Xylenes prices are unchanged in an inactive market but a 2000 ton parcel of virgin product is on offer from Turkey. In the US, commercial grade is selling at 64 cents/pound and nitration at 34 cents higher.

Paraxylene prices have shot up to \$340-355/ton in a tight market with little spot material available. There were unconfirmed rumours of a deal at \$350/ton and one trader suggested prices nearer \$360/ton.

Shell and BASF settled the Q1 orthoxylene contract price at DM480/ton to provide the only real business of the week as spot prices held at pre-Christmas levels.

Styrene availability in Rotterdam continues to be critical and although no major deals have been done. T1 product moved up to \$1240-1260/ton after buoyant demand from Far East derivative units lifted US levels from 55 cents/pound to 58-59 cents. Some product was sold at \$1320/ton fot. T2 is reported over a wide range \$1280-1310/ton. With renewed interest in styrene throughout the world observers are expecting the Q1 contract to be fixed, at over DM2300/ton well ahead of the last quarter.

Both T1 and T2 methanol prices have increased with the dollar's influence lifting T1 levels in the Med as high as \$190/ton cif.

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News About New Projects

PRESSINDUSTRIA IN SOVIET BUTYL RUBBER VENTURE

Pressindustria of Italy, a long established trading partner with the Soviet Union, is setting up joint ventures in the USSR to produce butyl rubbers and to carry out research.

A letter of intent has been signed by Nikolai Lemayev, Soviet minister of the oil processing and petrochemicals industries, and Dr. Paolo Straneo, managing director of Pressindustria, to set up two joint ventures.

The first, in which Pressindustria will hold a 30 per cent interest, will be for the production of butyl rubbers. The plan is to build a 90 000 ton/year plant at the Tobolsk petrochemical complex in Siberia. Of the total, 60 000 ton/year will be produced in the form of ordinary butyl rubber and 30 000 ton/year chlorobutyl rubber.

Two thirds of the production, Pressindustria says, will be absorbed by the Soviet market, mainly in the car and truck industries, and one-third will be exported.

The Italian company estimates that the total sales turnover generated by the joint venture when it begins production in 1991, will be L300bn (\$256.6m). The price of butyl rubber, depending on quality, is put at between \$2 000-3 000/ton, chloro-butyl rubber being at the upper end of the scale.

Pressindustria's suspension process will be used to produce the butyl rubber while the halogenated butyl rubber production will be based on a process developed by Giproskautchuk of the USSR and the Ital-

ian company. The Soviet Union already produces butyl rubber at Togliatti. The chlorobutyl rubber unit will be the first of its type in the USSR, however. Pressindustria has supplied polymerization sections to the butyl rubber plant at Togliatti. Using the solution process, the plant is currently under start up phase with three of the six polymerizers already working. The Soviets built the monomer purification and monomer solution preparation sections at the Togliatti plant.

A company within the Pressindustria group will be responsible for the engineering and equipment supply for the Tobolsk complex. The complex is destined to become a major rubber production centre. An 180 000 ton/year butadiene plant was commissioned late last year at the site.

The second deal envisages the setting up of a technological centre for research into processes and equipment in the fields of polymer rubbers. This, says Pressindustria, will be the first collaboration in research between Western companies and Soviet ministries in the USSR.

The result of the research will be patented and exploited in the USSR and/or in other countries and incorporated into new production facilities by Pressindustria. Pressindustria has supplied many plants to the Soviet Union including the world's largest ethoxylation plant based at Nizhnekamsk.

FIRMS JOIN FORCES IN ZEOLITES

Two Belgian Companies, UCB and Solvay, and Italy's Ausidet, a subsidiary of Montedison, are joining

forces in a project to produce sodium aluminium silicates (zeolites 4A) used in the formulation of detergents.

The plant will have a capacity 40 000 ton/year and will be sited Ostend in Belgium, where a production unit recently shut down by UCB will be converted. This will reduce the costs of the investment and enable manufacture to commence the end of 1988 or the beginning 1989.

The enterprise will benefit from the support of the three groups. UCB will bring in its manufacturing installations, Solvay the soda and silica raw materials, and Ausidet the knowledge of the market, together with the technology which it has developed and perfected in its own 75 000 ton/year production plant at Croton in Calabria.

The new employment at Ostend will partially compensate for the closure in September of UCB's plant producing sodium tripolyphosphate and phosphoric acid.

The European market for zeolites is growing at 20 per cent/year according to UCB.

CHEMINOVA EXPANDS

Denmark's Cheminova is more than doubling capacity for sorbic acid and potassium sorbate. The project, due on stream in 1989, will raise capacity to 1 500 ton/year at the company's Lemvig complex in the western part of Denmark.

The products, used as food preservatives, are relatively new to Cheminova. The existing sorbic acid/potassium sorbate plant has capacity for around 700 ton/year.

Cheminova is the world's largest producer of organo-phosphorus

ecticides and intermediates. Its most known insecticide is malathion which the company sells under the fanon trade name. Other products include ethyl and methyl parathion.

DSM TO SPEND ON GELEEN CRACKERS

The Dutch chemicals producer DSM has announced plans to invest fl. 1.4bn (\$760m) on a project to modernize and revamp its two ethylene crackers at Geleen. The crackers, together with an ammonia plant, form the heart of DSM's activities at Geleen.

The revamp and modernization programme will ensure that the crackers remain up-to-date at least to the year 2000. The plants, which have built-in flexibility to use naphtha and gas oil, were built in 1972 and 1979 and have capacities of 350 000 ton/year and 450 000 ton/year of ethylene respectively.

The aim is to increase this to 375 000 ton/year and 475 000 ton/year giving the company a combined ethylene capacity of 850 000 ton/year.

The investment will help maintain and improve DSM's position as a low cost producer. Without this programme, the company says, the life cycle of the two crackers would end in the early 1990s and they would cost around Dfl. .2bn to replace.

BASF 1988 BUDGET

BASF has announced a group capital spending budget worth DM3bn (\$1.84bn) for 1988. This compares with DM2.8bn spent on tangible capital assets in 1987.

Around DM1.4bn (47 per cent) is for projects of parent company BASF AG of Ludwigshafen, another DM500m (17 per cent) will be spent by West German group companies.

A total of DM450m (15 per cent) has been set aside for European subsidiaries including DM270m for BASF Antwerp. Overseas subsidiaries will have DM650m (21 per cent) to spend, including DM500m earmarked for US-based BASF Corp. Some 10 per cent of the total will be spent on environmental protection.

KEMTEC BUILDS AROMATICS COMPLEX IN CANADA

Kemtec Inc, a subsidiary of Lavalin Industries, the largest engineering company in Canada, is investing Can\$100m (\$76.6m) in three new petrochemical plants on its Montreal East site.

The project, for which construction will start in the spring, will consist of a 150 000 ton/year cumene plant, a 180 000 ton/year paraxylene unit and a toluene disproportionation unit capable of producing 150 000 ton/year of xylenes. The Morgan Bank of Canada will provide the major portion of the financing package. The contract for detailed engineering and construction will be awarded to Partec Laval of Calgary.

Benzene raw material will come from Kemtec's existing operations while propylene will be purchased from local suppliers such as Shell and Petromont. The cumene plant will use UOP technology. Selection of the toluene disproportionation technology is not yet finalized.

Technology for paraxylene will be crystallization at low temperature using a large portion of the equipment purchased from a plant at present shut down in Puerto Rico.

This will enable Kemtec to produce paraxylene of very high purity and improve competitiveness by taking advantage of the attractive electricity tariffs in Quebec.

Kemtec started its operations a year ago by reactivating the petrochemical complex of the former Gulf Canada refinery in Montreal. It currently produces around 200 000 ton/year of aromatics, including 100 000 ton/year of benzene and about 80 000 ton/year of xylenes. Some 100 000 ton/year of toluene is also produced which is dealkylated to xylenes.

The latest project will enable the company to tap new markets and increase the value added to its products. At the same time, the company will become a Canadian leader in the production of cumene, phenol and their derivatives as well as in the manufacture of paraxylene and aromatics in general. Construction of other units for derivatives of cumene and paraxylene is also planned in the future.

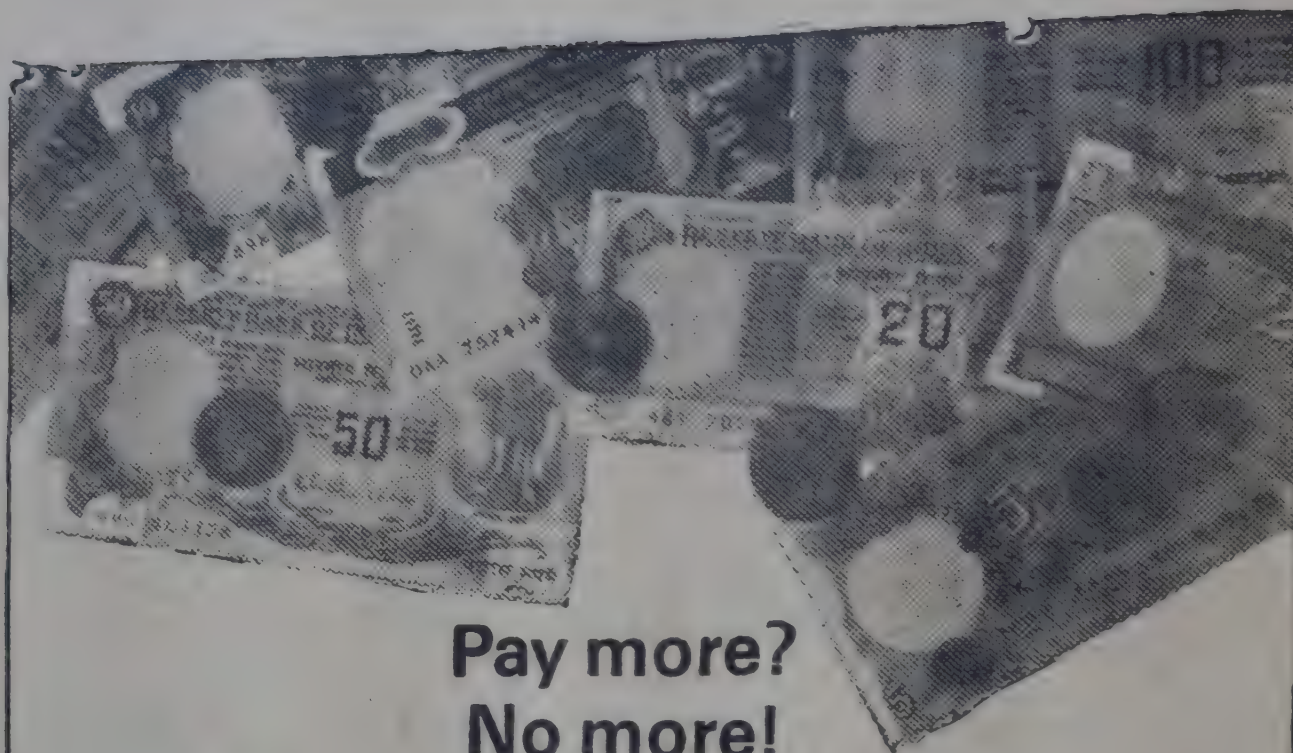
Damien De Gheldere, Kemtec's vice president of development, told that the market for the products is very strong. In the Far East new purified terephthalic acid plants are under construction and will push up demand for paraxylene.

The US market is also getting closer into balance. In addition, exports of paraxylene from the USSR into Europe could disappear when a new PTA plant is completed there, De Gheldere said.

TAIWANESE FIRMS IN PHILIPPINES.

Two Taiwanese petrochemical groups, USI Far East Corp and China General Plastics Corp are investing \$220m in a new petrochemical complex in the Philippines.

The investment envisages the construction of a 200 000 ton/year naphtha cracker, along with 120 000 ton/year polyethylene and 100 000 ton/year polypropylene plants.



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NEWS FROM JAPAN

LDPE Makers Moving Toward Expanding Production

Japan's LDPE industry is contemplating working out measures for coping with the expiration of a speciality law (Temporary Measures Law for Structural Adjustment of Specific Industries) scheduled for July this year. Domestic makers have reduced their combined production capacity to 1,194,000 tons a year in line with the said law.

They are operating their manufacturing plants at full capacity duty mainly to increasing L-LDPE demand. L-LDPE is about yen 10/kg cheaper than LDPE and commands 20% of the plastic film market. L-LDPE demand is projected to continue increasing and the product will eventually take the place of LDPE.

Mitsubishi Petrochemical — Japan's largest L-LDPE maker — envisages scaling up its annual production capacity from the current 75,000 tons to 90,000 tons a year. Nippon Unicar and Idemitsu Petrochemical are also moving toward increasing their production capacity.

Sumitomo Chemical and Showa Denko — both of which have suspended their LDPE plants — are considering producing L-LDPE by remodelling existing plants and commercialising special-grade LDPE using idle plants.

Polypropylene (PP) operations after the expiration of the speciality law are the largest topic for Japan's petrochemical industry, and construction of many new plants is now under consideration. LDPE makers are not planning to invest in new plant

construction but are likely to increase their combined production by about 200,000 tons a year through the various steps.

Kanebo Starts Constructing Polyester Resin Plant

Kanebo Ltd. has begun constructing a 20,000-t/year polyester resin plant at its Bofu factory, aiming at completion in the spring of 1989. The polyester resin from the Y3-billion plant will be used for bottles and X-ray base films.

Of the 20,000 tons, 15,000 will be supplied to Konica Corp., Japan's 2nd largest producer of photosensitive materials — for film use and the rest will be marketed by Kanebo for itself for bottle use.

This project reflects Kanebo's plastic business expansion plan, but it is also aimed at utilizing the excess in the labour force at the Bofu factory stemming from the transfer of a polyester fibre plant there to its Hokuriku factory and at utilizing the existing utilities at Bofu.

The new plant adopts the advanced continuous polymerization process mainly consisting of ester exchange, prepolymerization and ultimate polymerization.

Mitsui Toatsu's New Solvent Highlighted

Ethylene glycol monoisopropyl ether (brand name: Glycosolve IP) — a solvent used for paints and printing ink, etc., and commercialised by Mitsui Toatsu Chemicals, Inc. is currently in the spotlight.

This is because, as a result of a series of animal experiments conducted by NIOSH and CHA (both U.S.), it has been found that blood and testicle diseases as well as deformation are caused by ethylene-based glycol ethers and their use is expected to be regulated during this year.

In Japan, propylene oxide (PO)-based solvents are already replacing ethylene-based ones.

Mitsui Toatsu's Glysolve IP is attracting the attention of those concerned from the view point of product characteristics and price.

Mitsubishi Plastics Ups IC card output to 1 million pieces/m

Mitsubishi Plastics Industries Ltd. has expanded production of its IC cards to the 1-million-pieces/month level as they have been employed for a new TV set-utilising video-game machine developed and marketed from this fall by NEC Home Electronics Ltd. and also as a result of Mitsubishi's sales efforts.

It moved into IC cards for use in software for video-game machines in June 1985 with production of 100,000 pieces a month and demand in this area has been growing at a rapid pace reflecting the boom in such machines as well as their sophistication and diversification.

The company considers the IC and business one of its strategic areas and, in addition to game-machine use, IC-card use has been expanding for telephones, manufacturing system control, taxi metres and audio equipment.

Another target area of the company is advanced packaging materials and containers, particularly those for foodstuffs, and it is pushing R&D for them. In addition, it is carrying out LVD (laser vision disk) business and is approaching the publication

and data-recording sectors to achieve market expansion. Together with NHK, Japan's biggest broadcasting corporation, it is hurrying to develop a magneto-optical disk that is commercially viable.

Plastic-material output in '87 to be over 10 mil. tons

Japan's plastic-material production in 1987 is certain to have reached the 10 million-ton level for the first time. According to the Japan Plastics Industry Federation, it increased at the rate of less than 3% in the January-February period and began to increase rapidly last March. It continued to exceed the 600,000-ton level by a considerable margin every month after last June.

In particular, in September it stood at 869,000 tons, hitting a record monthly high. Combined

production from January through September amounted to 7,360,000 tons, showing a growth rate of 7.1% over the preceding year's results. In the October-December period it probably registered a 6% gain despite plant troubles occurring last fall one after another.

The main reasons for the sharp increase in plastic-material production are: (1) demand for use in civil engineering and construction was conspicuously brisk in the latter half last year, reflecting a construction boom bolstered by low interest rates and government policies aimed at expanding domestic demand; (2) synthetic-resin imports from Asian NICS — which sharply expanded in 1986 — drastically declined due to plant accidents in these countries, there was an increase in domestic consumption there, and the supply-demand si-

tuation for petrochemicals throughout the world was tight; and (3) plastic-material exports from Japan remained active despite the yen's appreciation against the dollar.

The growth rate of Japan's plastic-material production slowed down in the 1970s but production continued to show steady growth after 1984 and surpassed 9 million tons in 1985.

Japan is the world's second largest plastic-material producer, trailing the United States.

Suntory Starts New Department To Prepare For Drug Operations

Suntory Ltd. has started Novel Pharma Planning Department within its Pharmaceutical Division under its drug business-expansion policy. The company has taken various steps including construction of R&D facilities to prepare for undertaking drug business on a full scale. It will also start constructing a drug-development centre at Tatebayashi in the coming spring.

The new department is designed to carry out surveys on drugs, map out a strategy for new-drug development and conduct new-drug application work specified by the Pharmaceuticals Affairs Law.

Suntory revealed its intention of branching out into the drug field by constructing Suntory Institute for Biological Research in Osaka in 1975. Since then the institute has developed an interferon-gamma as an anticancer agent, a diuretic agent (hANP), an anti-arrhythmic agent and an agent effective for autism; all of them are now under clinical testing. The company may seek manufacturing approval for some of them this

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New Developments from Japan

Osaka Gas Developing Inexpensive Pitch-based C-C Composite Material

Osaka Gas Co. is developing carbon-carbon (C-C) composite material using coal pitch-based carbon fibre and pitch: carbon-fibre cloth is impregnated with the latter and a carbonization rate of more than 85% can be attained. Success in the project depends on the development of an efficient method for dipping the cloth in the said pitch in the impregnation process.

The company has utilized knowledge about pressure control — which it has obtained through development of high-density meso-carbon mouldings — in preventing C-C composite-material mouldings from cracking during the baking process.

It aims at pioneering markedly cheap C-C composite material, which it can supply at ¥50,000 to ¥60,000/kg. It intends to expand at a stroke the market for C-C composite material by taking advantage of the cheapness of the target product.

C-C composite material has strong resistance against high temperature, corrosion and abrasion. Its promising application fields are aircraft, aerospace and automobile parts. The market concerned, however, has not expanded to a satisfactory degree since expensive PAN-based carbon fibre is used as raw material and, as a result, C-C composite material now on sale is high-priced.

The products conventional manufacturing process has a defect in that it calls for repeated recycling of the product through impregnating/baking processes since the carbonization rate of

impregnating resin is 60% at most.

Mitsubishi Subsidiary Produces Neodymium-based Magnets

Dia Rare Earth Magnetics Ltd. — a joint venture between Mitsubishi Chemical Industries Ltd. and Mitsubishi Steel Mfg. Co. — has started supplying neodymium based magnets produced using a commercial plant (output 1 million pieces/m) at its Ichikawa factory. The products will be used as electronics material for OA and FA equipment.

The joint company has already commercialized samarium-based magnets using a through-production system in which alloy ingot is thermally treated and pulverized; binders are added thereto; and the resultant pellets are fed into an injection moulding machine.

At present the company buys magnetic neodymium particles from domestic companies and produces neodymium-based magnets therefrom. It envisages establishing some time in the future a through-production system for the products.

The products contain nylon-based binders having a low degree of thermal resistance and, as a result, can be used in the temperature range of -40°C to 100°C . Todate Daido Steel Co. is the only company in Japan to have gone into the production of neodymium-based magnets.

The maximum energy output of neodymium-based magnets is more than 10 times that of samarium-based ones. The value for the new product stands at 4.8-5.4. Its hardness and compressive strength are 8.6 and 8.9, respectively, both of which are nearly equivalent to the corresponding figures for samarium-based

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magnets. Neodymium is cheaper than samarium.

Q.P. Confirms Acetic Acid Producing Gene

In cooperation with the research group headed by Professor K. Yano, Faculty of Agriculture of Tokyo University, Q.P. Corp. has succeeded in the cloning of a gene having a function to produce acetic acid from acetic bacteria. They use a self-cloning method to confirm the gene having an acetic acid producing function.

Research from acetic bacteria genes is very rare and the research achievement by the company is a world-first. The company says that it will clarify the configuration of the bases of the gene as early as possible. Its ultimate goal in research is to develop a bacterium that shows a high fermentation speed and high stability.

New Solid NO Adsorbent Is More Than Twice As Efficient

Professor N. Tojima of the Engineering Faculty of Tokyo University has succeeded in synthesizing a unique high-polymer complex having a very high carbon monoxide (NO) adsorbing ability. Development of efficient NO adsorbents has been considered important not only from the viewpoint of environmental protection but also from that of resources recovery.

It has been known that some complex aqueous solutions have an excellent NO adsorbing ability. The solid high-polymer complex developed this time has proved to be capable of adsorbing more than twice as much NO as conventional aqueous solutions do. Tests have shown that it can adsorb NO almost perfectly even at a low concentration of 1,000 ppm, according to Tojima.

The professor explained that ferric sulfate is added to a chelating resin with an iminodiacetic-acid residue and an iron is

immobilized therein. The mixture is then cleaned by methanol and made into an adsorbent by drying at 50°C in a vacuum condition.

Ethylene Directly Produced From Methane Using Reactor

A research group at Chiba Institute of Technology has succeeded in directly producing high-purity ethylene from methane using a thermodiffusion-type reactor pipe (inner diameter: 2 cm; length: 50 cm).

They set a 0.5mm-diameter tungsten wire — used as a heating element — inside a cylindrical reactor pipe made from "Pyrex", fed in raw material gas (CH₄, 98.5%, O₂, 0.1%, N₂, 0.6% and CO₂, 0.8%), and heated the pipe up to 1,200°C under normal pressure. An essential point of this process is that the reactor pipe was installed with its inlet directed downward.

The maximum conversion rate, yield and selectivity of the process reach 10.8, 7.6 and 91%, respectively.

Studies are being conducted in Japan on how to directly produce ethylene from methane through a catalyst-applied oxidative coupling reaction of methane.

In connection with development of the new process, it is widely known that methane can be thermally transformed into oily material when a thermodiffusion-type reactor pipe is installed with its inlet directed upward.

In this case, the surface temperature of the tungsten wire and the flow of the raw material methane are set at 1,150-1,350°C and 0.7-1.21/h, respectively. The oily material thereby contained is equivalent to 60% of the raw material by weight.

Ruthenium Plating Process Bared: 30% Cheaper than Gold

Okuno Chemical Industries Co. has for the first time — developed technology for alkali ruthenium plating not carried out by electrodeposition

effectively to plating of leads of electronics parts and microswitch contracts since the layer produced by plating has high rigidity and good conductivity, though not as high as that in the case of gold plating. Ruthenium plating is about 30% lower in cost than gold plating but has not been successfully applied.

The most significant advantage of ruthenium is its hardness 4-5 times harder than rigid chromium when measured by a Taper machine. It is, however, inferior in conductivity to gold, but since its contact resistance has proved to be on a moderate level it can be practically applied to electronics parts plating.

Optical-Semiconductor Particles Applied To Sterilization

Prof. K. Matsunaga and his colleagues at Tokyo University of Agriculture and Technology have developed a new sterilization method using fine particle (diameter: below 25 μ m) of an optical semiconductor (anatase-type titanium dioxide).

They attached the fine particles to thin acetyl cellulose film at the rate of 4mg/cm², wound them into spiral form and put them into quartz pipes. They manufactured a flow-type sterilizing reactor consisting of 20-30 units of the quartz pipe, a pump and a mercury lamp.

As a follow-up step, the researchers put sample water containing 10³ cells of Escherichia coli in the reactor, added 8 cm² of the abovementioned film thereto and applied light thereupon using the mercury lamp. As a result, the microorganisms were completely killed in an hour.

The sterilization method is capable of killing Escherichia coli, lactic-acid bacteria, green algae and baker's yeast, etc., and deodorizing water. The researchers claim that it will find application in the pharmaceutical and food

GACL plans Rs. 330 cr. investment

Gujarat Alkalies and Chemicals Ltd. (GACL), India's largest chloralkali unit, proposes to invest around Rs. 300 crores in a number of projects in the next four years.

Among the major projects it has drawn up is the one to manufacture secondary alkane sulfonate (SAS) which finds application in the production of detergents and can also be used as an effective disinfectant. For the Rs. 60-crore project, GACL intends to form a subsidiary company with a plant capacity of 24,000 tonnes per annum. While the reputed pharmaceutical company, Hoechst has agreed to part with its know-how for the project, negotiations are on for Hoechst's financial participation also. For testing and marketing the product in India, the government has allowed GACL to import 500 tonnes of SAS from West Germany this year. This project is expected to be commissioned in 1991-92.

According to the managing director of GACL, Dr. P. K. Das, SAS will prove to be a boon to small-scale manufacturers who can buy the product in bulk from GACL and lower the concentration and sell it in the market as a disinfectant. The company hopes to form women's co-operatives for undertaking this operation on a large-scale.

In an exclusive interview with **The Economic Times**, Dr. Das revealed that GACL hoped to participate in the gas-based project of Gujarat State Petrochemical Corporation in Hazira in a big way. The company proposes to invest Rs. 140 crores in the giant Rs. 7,000-crore complex.

Among the other projects, GACL has drawn up for launching early is the expansion of chloro-

methane capacity at a cost of Rs. 8 crores, adoption of membrane cell technology in caustic soda manufacture, de-bottlenecking facility at a cost of Rs. 39.40 crores to be operational in 1988-89 and a salt washery costing Rs. 1.7 crores to upgrade the quality of salt manufactured in Saurashtra.

Five of GACL's projects on hand are scheduled to be commissioned during the next two years. They are cold box (upgradation of methane for chloromethanes) costing Rs. 5.80 crores, conversion of caustic soda into electronic grade and superdense soda ash which has wide applications in the TV tube and glass industries (cost Rs. 5.90 crores) manufacture of potassium hydroxide and potassium carbonate (cost Rs. 3.50 crores) and sodium hypochlorite (cost Rs. 70 lakhs).

With investments of this order, the company is going in for a rights issue at a premium of 10 per share. In the near future, the company will also be resorting to expansion of its equity base to meet the various financial requirements. The share capital of the company at the end of 1986-87 stood at Rs. 8.93 crores with the public holding 62 per cent.

According to Dr. Das, the company is poised for exceeding the 1987-88 projected sales of Rs. 81.40 crores and touch Rs. 90 crores. The turnover for the first six months of the financial year ending March 31 1988 is likely to be higher by 24 per cent. However, profits are not expected to show any rise because of two reasons: hike in power tariff and excise on the company's products during the year.

The company expects to double its sales turnover by 1991-

92 to Rs. 172 crores when the new project fully materialises. The SAS project is then expected to contribute Rs. 34.76 crores to sales, while chlorine, caustic soda flakes, chloromethanes and potassium carbonate will be the other major income earners.

The high power cost in Gujarat and frequent disruption in supplies are the two problem areas for the company. As the electrolysis process of manufacturing caustic soda and chlorine is highly power-intensive, the company is going in for a technology which reduces power consumption. The company will also be participating in the setting up of a 135 MW power plant by Gujarat Industries Power Company Ltd. along with GSFC, GNFC and Petrofils Co-op. Ltd. Power is expected to be available from this station in about 18 months.

On the export front too, the company is maintaining a steady growth. During the period April-December 1987, the company exported chemicals valued at Rs. 85 lakhs, against Rs. 38.19 lakhs during the whole of 1986-87. The company is confident of crossing the Rs. 1-crore mark for the year.

In the face of stiff international competition, it exported sodium cyanide and chloromethanes to the USSR, Australia, New Zealand, the Phillipines, Taiwan, Japan, Malaysia and South Korea.

AMARAVATHI CHEM TO ENTER CAPITAL MARKET

Amaravathi Chemicals, a new unit coming up in Pondicherry for the manufacture of sorbitol using, for the first time in India, "low pressure technology", is all set to go on stream by May this year.

The Rs. 5.40 crores project, promoted by two technocrats,

Mr. R. V. M. K. Prasad and Mr. A. Ramesh, belonging to Prasad Productions, a big movie making outfit in the south, as a diversification venture is being completed without any cost over-runs. On the other hand, there is every indication that the company will be saving at least half a million rupees by completing the project according to schedule.

The company is entering the capital market about the second week of March this year to raise Rs. 60 lakhs through a public issue of 600,000 equity shares of Rs. 10 each for cash at par. Of the total, 240,000 shares are being reserved for allotment to non-resident Indians or persons of Indian origin residing abroad on a repatriation basis.

A feature of the project is that marketing agreements have already been entered into for the entire production. The annual capacity of the plant is for the manufacture of 3,300 tonnes of sorbitol from tapioca starch. Besides, the company could also manufacture tapioca starch, dextrose monohydrate, dextrose anhydrous, malto dextrine and fructose which are expected to be taken at a later stage.

The successful tying-up of marketing arrangements for the entire output has come as a shot in the arm for the project, the only sorbitol manufacturing unit in the south and indications are that the company is already looking into the prospect of expanding the capacity.

Sorbitol, apart from being the basic raw material for the manufacture of vitamin C, is also extensively used in the production of pharmaceuticals, cosmetics, toiletries, paints, cigarettes, paper, leather and textile industries.

The process technology and equipment has been provided by a Danish firm with performance guarantees. By using the low pressure technology, considerable saving of energy has been

ensured. At present, sorbitol is manufactured in India using high pressure temperature technology. The project is located at Palayam, 11 km. from Pondicherry.

The demand for sorbitol by 1989-90 is estimated at between 26,000 and 29,000 tonnes with a growth rate of between 12 and 15 per cent a year. The present capacity, including the expansion of existing units, works out to around 19,000 tonnes a year. The project is expected to break even at 57 per cent capacity. Pondicherry being a Class A backward area, sales tax refund and 33 per cent rebate in power charges are available for the company.

JBF DIVERSIFYING INTO DRUGS, CHEMICALS

JBF Synthetics Ltd., headed by Mr. Bhagirath Chandulal Arya, is diversifying into industrial solvents, bulk drugs and chemicals.

The bulk drug is a 100 per cent export unit with tie up from a company incorporated in the U.S. The chemical's unit is likely to go on stream by mid-1988. Industrial solvent will be a degreasing agent. Since this item is now being imported, the project will be an import-substitute one, says a company press release.

JBF was originally floated as a private limited company for yarn texturising, twisting and dyeing. It was converted into a public limited one in 1985 and it came to the market in 1986.

The issue was several times over-subscribed. Now JBF Synthetics Limited is having three textile manufacturing units at Mahad, Silvassa and Sachin. The first one is located in Maharashtra, the second in the Union Territory and the third one in Gujarat.

As regards diversification, the press note adds, the Arya group which was so far essentially a

textile one, is now diversifying into bulk drugs and chemicals. As part of its diversification programme, a Rs. 5-crore Trichloroethylene plant is being set up and the plant is expected to go on stream soon.

It is also setting up a methyldopa plant with technical tie-up from Intertech Research Corporation, the U.S. Methyldopa is a time-tested bulk drug being used to make anti-hypertension and cardiovascular medicines. Under the buy-back arrangement, the entire production in the first five years, will be exported to foreign collaborators. The Rs. 3-crore plant is expected to go on stream in June 1988.

Trichloroethylene is a versatile industrial solvent which is currently being imported to the extent of half of India's annual requirements. The plant is coming at Pondicherry, a notified backward area and a power-surplus State.

NATIONAL ORGANIC

National Organic Chemical Industries Ltd. (NOCIL) has fared well during 1987 despite biennial shut down of the plant for five weeks during the later half of 1987.

Revealing this at an extraordinary general meeting of the company, chairman Mr. Arvind N. Mafatlal has stated that the outlook for the current year is also extremely good.

Referring to the company's expansion programme Mr. Mafatlal said that the same has been delayed, since the government is looking into the problems of environment and pollution control before clearing the projects.

The company's agro-chemicals division is also doing well. It is planning to introduce two new products during the current year, at the cost of Rs. 4.5 crores. This division is expanding fast and has a good outlook.

MARKET INFORMATION

Hydrogen Peroxide Flares Up

Due to irregular deliveries from the manufacturers, the price of Hydrogen Peroxide moved up to Rs. 32 per kg. Seasonal demand has pushed up the prices of Citric Acid, and the commodity moved up by Rs. 3, to be traded

at Rs. 45.

PVA 173 registered a downward trend to be quoted at Rs. 96 and GH-17 finished at Rs. 86.

Alpha Naphthylamine, Diethyl Aniline and Gamma Acid continue to be

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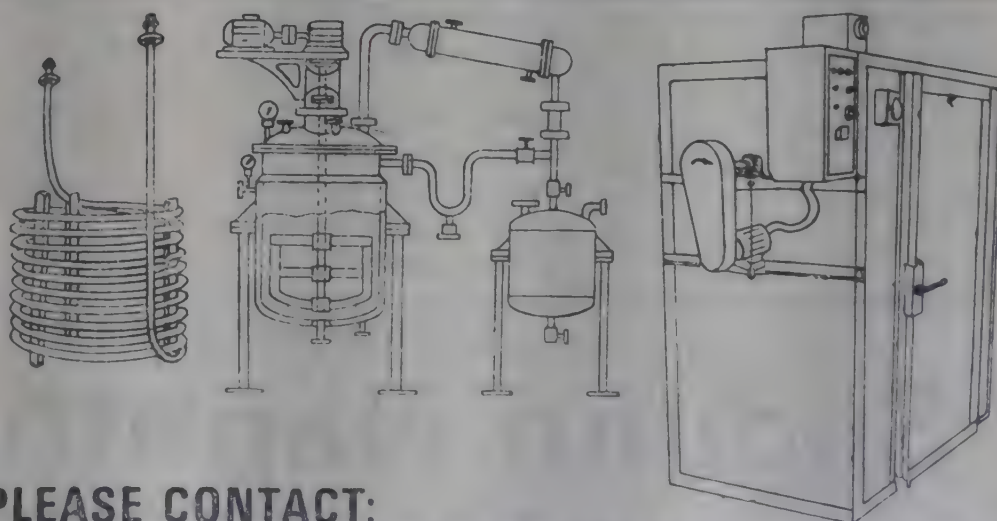
The prices are inclusive of Excise and Maharashtra Sales Tax.

in short supply, while MPDS moved up to Rs. 210 per kg. The market otherwise maintained a steady trend.

(Prices as on 27th January, 1988)

INDUSTRIAL CHEMICALS	Per kg.				
Ammonium sulphate	2.00	Boric acid (Tech.)	21.00	Cream of Tartar (Tech.)	64.00
Ammonium phosphate (Mono)	14.50	Bisphenol-A	46+ST	Citric acid (Belgium)	40.00
Ammonium phosphate (Di)	12.00	Butyl carbitol	35.00	Citric acid (Indian)	45.00
Ammonium carbonate (Di)	17.00	Caustic soda (Flakes)	8.50	Copper sulphate	17.00
Ammonium bicarbonate	4.75	Caustic soda (Solid)	7.75	Chromic acid	50.00
Ammonium chloride	3.50	Caustic soda (Lye)	6.00	Cyanuric chloride	120.00
Ammonium nitrate	4.00	Calcium chloride 70% (solid)	3.25	Cobalt oxide	280.00
Arsenic white powder	21.00	Calcium chloride 75-80% (fused)	3.50	Carbitol	52.00
Acrylamide (Resale)	59.00	Calcium chloride 36% (Anhydrous)	5.00	Dicalcium phosphate (Anhydrous)	16.00
Barium carbonate	6.00	Calcium Carbonate PPT	3.00	Ferric chloride (Lumps)	6.00
Bleaching powder (33% Cl)	3.75	Calcium carbonate (Activated)	3.55	Ethylene urea	56.00
Borax (Granular)	15.00	Camphor (Indian)	80.00	Glue flakes	8.45
Borax (Powder)	15.50	Cresylic acid	50.00	Glue sheets	6.75
				Gohsenol GH-17 (Resale)	86.00

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Hexamine	29.00	Santobrite (Indian)	36.00	Cyclohexanone	43.00
Industrial Wax	25.00	Soda Ash (Tata)	3.90	Cyclohexanol	34.00
Litharge	15.00	Soda Ash (Birla)	3.75	Diacetone	31.00
Lead Acetate (Tech.)	28.00	Soda Ash (Imp.)	3.50	Diethylene glycol (DEG)	52.00
Lithopone	15.00	Sodium bicarbonate	5.25	Diethyl Phthalate	56.00
Magnesium chloride (crystal)	2.00	Sodium bisulphite	4.50	Diallyl Phthalate	28.00
Menthol crystal (Flakes) 185+Ex.+ST		Sodium silicate	3.00	Dimethyl Phthalate	52.00
Menthol bold	205+Ex.+ST	Sodium acetate	5.90	Diethyl Adipate	42.00
Menthol crystal bold	245+Ex.+ST	Sodium alginate	220+ST	Dibutyl Adipate	15.00
Magnesium carbonate (Japan)	16.00	Titanium Dioxide (Anatase)	53+ST	Dipentene	12.00
Magnesium carbonate (Indian)	15.00	Titanium Dioxide	60+ST	Dimethylamine 40%	14.00
Maleic Anhydride (per kg)	38.00	(Rutile — RCR ₂)	94.00	Dimethylamine 60%	23.65
Mercury (75 lbs.)	9,000.00	Tartaric acid (Crystal)	4.80	Ethyl Acetate	46.00
Nickel chloride	60.00	Trisodium phosphate	69+ST	Ethyl Acrylate	11.00
Oxalic acid	19.00	Thiourea	2.75	Ethylene Dichloride	23.25
Peppermint oil (Rectified) 90+Ex.+ST		Urea (Tech)	1.00	Ethylene Glycol	30+ST
Potassium carbonate (Indian)	19.00	Vacuum salt	30.00	Formic Acid (Imp.) (Resale)	5.80
Potassium carbonate (Imported)	21.00	Zinc Dust	30.00	Formaldehyde	49.00
Potassium bichromate	22.00	Zinc Oxide		Glycerine (CP)	45.00
Potassium phosphate (Mono)	14.00	Zinc chloride powder	14.00	Glycerine (IW)	
Potassium phosphate (DI)	14.00	(technical)	3.90	Hydrogen peroxide 50%	
Polyvinyl alcohol (No. 117)	88.00	Zinc sulphate		(Resale)	32.00
Polyvinyl alcohol (No. 173)				Isopropyl Alcohol	17.50
(Resale)	96.00	SOLVENTS	Per kg.	Isobutyl Alcohol	28.00
Polyvinyl alcohol (No. 208)	95.00	Acetic Acid (Glacial)	13.50	Monoethanolamine	46.50
Paraformaldehyde	18.00	Acetic Anhydride (Resale)	24.00	Melamine	43+ST
Phthalic anhydride 96%	23.25	Acetone (Resale)	19.00	Morpholine (Indian)	65.00
Pentaerythritol (Resale)	53.00	Adipic Acid	50.00	Methyl Ethyl Ketone	36.00
Paraffin wax	13.50	Aceto Acetanillide	50.00	Methyl Isobutyl Ketone	36.00
Rangolite (German)	70.00	Aniline Oil	44.00	Methyl Acrylate	42.00
Rangolite (Czech.)	46.00	Benzoate Plasticiser	33.00	Methylene Dichloride	24.00
Sodium sulphate (Fine)	4.00	Butyl Acetate	39.00	Meta Cresol	45.00
Sodium sulphate (Coarse)	3.80	Butyl stearate	36.00	Nitrobenzene	17.00
Sodium sulphide 50-52%		Butyl acrylate	66+ST	Nitric Acid (Con.) (RCF)	2.50
(Flakes)	8.00	Butanol (Resale)	35.00	Ortho Cresol	32.00
Sodium sulphide 58-60%		Benzyl chloride	24.00	Phenol	35+ST
(Flakes)	9.00	Benzo trichloride	16.00	Propylene Glycol	30.00
Sodium sulphide pure (Flakes)	12.25	Benzoyl chloride	22.00	Polyethylene Glycol (No. 200)	40.00
Sodium nitrite	13.25	Benzyl alcohol (FPC)	36.00	Polyethylene Glycol (No. 400)	37.00
		Bromine Liquid	42.50	Polyethylene Glycol (No. 500)	42.00

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Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	11.75
Triethylamine	50.00
Vinyl Acetate Monomer	40.50

SOLVENTS	Per Litre
Benzene	8.80
N-Heptane	8.00
N-Hexane	8.75
Methanol	6.75
Solvent Naphtha Heavy	9.50
Solvent Naphtha Light	8.50
Toluene	9.25
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Anthraquinone	80.00
Anthranilic Acid	62.00
2-Amino-4-Nitrophenol (Imp.)	140.00
Blue B. Base (Local)	235.00
Beta Naphthol (Atul)	55.00
Benzidine Dihydrochloride (BDH)	72.00
Bromamine Acid	375.00
BON Acid	105.00
Chicago Acid	280.00
Coach Acid	53.00
C. Acid (Imp.)	260.00
Cyanuric Chloride (Japan)	118.00
2, 4, DNCB	26.00
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Diethyl Aniline	150.00
Di-amino stilbene disulphonic acid	120.00
3, 3-DCB (Imp.)	165.00
Gamma Acid (Atul)	165.00
H. Acid (Atul)	150.00
G. Salt	56.00
Isophthalic Acid	39.00
J. Acid	275.00
J. Acid Urea	270.00
K. Acid	95.00
MDPS (German)	210.00
MNA	75.00
Meta Urido Aniline	135.00
MPD (Local)	130.00
MPD (Japan)	150.00

Naphthalic Acid	390.00
N- Methyl J. Acid	135.00
N-Methyl Aniline	21.00
Naphthalene crude	24.00
Naphthalene (Refined)	84.00
Ortho Anisidine (OA Imp.)	10.50
Ortho Dichloro Benzene (ODCB)	93.00
OT Base	16.00
Para Dichloro Benzene (PDCB)	110.00
Para Anisidine (PA-Imp.)	87.00
Para Anisidine (PA-Local)	66.00
PNA	325.00
Para Cresidine (Imp.)	125.00
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PNCB	140.00
Para Amino Acetanilide	115.00
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Para Amino Benzoic Acid	88.00
PT Base	505.00
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Resist Salt	140.00
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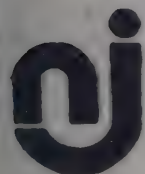
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Bombay Dyes Market

(Prices as on 27th January, 1988)

ACID COLOUR		Per Kg			
Acid Violet 4BS		143.00	Brill. Violet Extra		126.40
Acid Maroon V		110.00	Blue 2B		86.60
Acid Orange II		77.80	Blue G		170.50
Acid Orange ILY		63.05	Sky Blue FB		188.25
Acid Red A		107.25	Copper Blue GR		147.00
Crosein Scarlet MOG		155.00	Fast Greenish Blue GL		114.60
Acid Scarlet 3R		99.90	Developed Black BT		116.10
Acid Red 38N		135.00	Blue NB-2B		300.20
Acid Red R2R		132.00	Blue NB-2BC		185.30
Acid Red RS		88.00	Developed Black NB-GHB		185.30
Acid Green V		230.00	Green B		111.65
Acid Patent Blue AS		250.00	Green NB-B		188.25
Acid Coomasi Blue		200.00	Green 2B-N		188.25
Acid Yellow 5GN		65.00	Brown MR		154.40
Acid Red PG		85.00	Brown CN		107.25
Acid Red GRS		78.00	Golden Brown G		140.35
Acid Black 10 BX		121.95	Catechin G		120.50
Acid Black BX		98.40	Omega Tan		126.40
Acid Black Wax		135.50	Catechin GS		102.80
Procinil Yellow GS			Black E Hly Conc.		142.60
(ICI, UK)		265.00	Black E Extra Hly Conc		142.60
Procinil Red GS (ICI, UK)		530.00	Black NB-ER Hly. Conc.		310.50
Procinil Blue RS (ICI, UK)		315.00	DISPERSOL COLOURS		Per Kg
Procinil Scarlet G			Yellow 6G Powder		143.80
(ICI, UK)		600.00	Red B 3B Powder		247.80
Procinil Orange G			Red B 2B Powder		323.20
(ICI, UK)		250.00	Red CB Powder		439.15
Procinil Rubine (ICI, UK)		550.00	Red D2B Powder		477.40
DIRECT COLOURS		Per Kg.	Violet C 4R		521.90
Yellow 3GX		88.10	Blue BG Powder		235.45
Gun Yellow RCH		124.00	Blue BN Powder		103.75
Fast Yellow GCH		141.15	Blue D 2R Powder		476.25
Yellow CFG Hly. Conc.		312.00	Navy BT Powder		243.90
Fast Yellow GS		111.65	Blue B 2G Powder		210.20
Fast Yellow CHRS		95.45	Black BT Powder		182.60
Viscose Orange A		166.15	Blue BR Powder		390.20
Fast Orange GR		133.75	Yellow 7GL		338.60
Red		96.90	Yellow 5RX		218.80
Dark Tan		78.25	Yellow 3G		367.25
Red IIR		72.55	Yellow		140.00
Red 4B		169.10	Yellow AL		135.30
Bordeaux BW		132.30	Yellow Brown REL		247.50
Fast Scarlet 4BS		166.55	Yellow FFL		463.60
Red 12B		170.55	Gold Yellow GG		259.70
Bordeaux Hly Conc.		194.00	Pink REL		247.00
Cotton Red N		117.05	Red REL		468.65
Brill. Fast Helio B		278.00	Red 2B		327.40
Brill. Fast Helio 2B		297.00	Red FB		324.20
Brill. Fast Helio 2B		297.00	Red Violet FBL		469.85
Brill. Fast Helio 2RS		136.20	Orange 3R		196.65
Brill. Fast Helio BS		116.10	Violet 3R		280.00
			Violet RL		275.45
			Violet 6R		485.75
			Scarlet RR		214.85
			Rubine 3B		223.05
			Rubine CB		364.90
			Blue GL		318.95
			Blue BGF		636.55
			Navy Blue RF		270.40
			Brown 3REL		200.40
			Black GEL		324.20
			Dark Brown 3B		317.40
			BASE COLOURS		Per Kg
			Fast Yellow GC		80.20
			Fast Orange GC		135.45
			Fast Scarlet R		166.90
			Fast Scarlet RC		126.65
			Fast Scarlet RCR		99.05
			Fast Scarlet G		121.65
			Fast Scarlet GN		91.50
			Fast Scarlet GG		72.70
			Fast Scarlet GGS		72.75
			Fast Red B		203.20
			Fast Red RC		119.15
			Fast Red R Flakes		149.25
			Fast Red TR		166.80
			Fast Red TR Oil		183.15
			Fast Red RL		237.10
			Fast Red KB Oil		201.90
			Fast Bordeaux GP		201.95
			Fast Garnet GBC		94.05
			Fast Violet B		505.60
			Fast Blue BB		521.45
			NAPHTHOL COLOURS		Per Kg
			ASG		217.00
			AS		143.00
			ASSW		279.75
			ABBS		189.15
			ASBO		195.65
			ASD		175.50
			ASOL		179.35
			ASTR		279.75
			ASPH		279.75
			ASE		196.05
			ASEI		184.40
			ASLB		1632.60
			ASBT		1817.00
			ASWG		143.00
			ASSG		397.70
			ASSR		480.50

ROCIION COLOURS		Per Kg.					
Golden Yellow HR		181.80	Navy Blue M 3R	310.95	Blue R Conc. Pdr. Fine	577.85	
Brill. Yellow H4G		117.85	Brill. Blue MR	331.70	Blue RR Supra Powder	629.35	
Supra Yellow H-8GP		168.55	Brill. Blue M RX	214.20	Blue Conc. Powder	545.80	
Brill. Yellow HE6G		166.95	Brill. Blue M-G	382.30	Brill. Blue 2R Hly. Conc.	378.55	
Yellow H-E4R		276.05	Blue M 4GD	344.60	Brill. Blue 2R Supra Disp.	115.65	
Brill. Yellow H7G		332.30	Navy Blue M RB	318.75	Dark Blue 2R Powder Fine	389.25	
Yellow M4R		243.95	Turquoise M-G	197.85	Blue BC Supra Disp.	359.40	
Yellow M GR		326.05	Brill. Blue M GX	302.50	Jade Green XBN Powder Fine	438.20	
Brill. Yellow M4G		177.10	Blue 3R Acra Powder	718.20	Jade Green XBN Acra		
Brill. Yellow M8G		332.30	Dark Brown H 6R	248.45	Conc. Powder	823.90	
Yellow M 3R		217.60	Cobalt Oxide (per kg.)	285.00	Jade Green 2G Pdr. Fine	419.65	
Brill. Orange H 2R		241.85	Green H 4BD	269.80	Jade Green 2G Ptg. Paste	125.40	
Brill. Red H 7B		157.95	Green H-E4BI	169.80	Jade Green XBN Ptg. Paste	126.00	
Brill. Orange M 2R		313.15	Red Brown H IF	143.25	Jade Green 2G Supra Disp.	496.00	
Brill. Red H 8B		169.45	Orange Brown H 2B	209.05	Olive Green B Pdr. Fine	399.90	
Brill. Scarlet H RN		245.05	Brown M GRN	188.80	Olive D Pdr. Fine	444.30	
Supra Red H-3BP		179.30	Black H-N	283.35	Olive Green B Supra Disp.	308.25	
Brill. Red H-F3B		243.45	SULFUR COLOURS		Per Kg.	Jade Green XBN Supra	
Brill. Magenta HB		187.00	Navy Blue	99.85		Disp. (N)	327.30
Brill. Red M 5B		98.90	Green G	138.55	Olive OMW Pdr. Fine	698.55	
Brill. Red M 8B		173.70	Black Grains Extra	62.05	Olive OMW Supra Disp.	538.05	
Brill. Pink MB		137.10	Black Grains OG	64.55	Olive R. Pdr. Fine	422.95	
Brill. Magenta MB		121.55	Black GXE Conc.	61.60	Olive D Supra Disp.	361.70	
Brill. Purple H-3R		180.20	Black GXE	52.75	Olive R Supra Disp.	363.90	
Brill. Purple H-7R		175.40	Black GXR	61.60	Olive D. Ptg. Paste	193.00	
Navy Blue H 3R		298.50	Black Grains 800	54.20	Olive Green B. Ptg. Paste	199.10	
Brill. Blue H-GR		366.55	Black EXR Grains	64.55	Olive Green B Acra Conc.	542.75	
Brill. Blue H 5G		173.10	Black EXR Grains 800	51.25	Olive R Acra Conc.	640.00	
Blue H 5R		283.95	VAT COLOURS (ICI)		Per Kg	Olive Green B Acra Conc.	542.75
Brill. Blue H 7G		178.70	Yellow 5G Powder Fine	673.15		Brown R Pdr. Fine	835.00
Brill. Blue H 7RX		358.15	Yellow 5G Supra Disperse	439.30		Brown G. Pdr. Fine	795.00
Turquoise HA		234.45	Yellow 5G Acra Con.	628.75		Brown R Pdr. Fine	659.75
Supra Blue H-3RP		335.70	Yellow 3R Powder	588.85		Dark Brown 3R Pdr. Fine	685.00
Supra Turquoise H 2Gf		181.50	Gold Orange 3G Pdr. Fine	952.15		Brown G. Supra Disp.	449.90
Blue H-ERD		305.80	Brill. Orange 6R Pdr. Fine	624.35		Brown 2G Supra Disp.	554.00
Navy Blue H ER		258.60	Gold Orange 3G Supra Disp.	601.30		Brown R Supra Disp.	422.95
Blue H 5RX		269.30	Brill. Orange 6RX Powder	394.30		Brown BR Powder	719.00
			Brill. Red 3B Pdr. Fine	997.80		Dark Brown 3R Ptg. Paste	217.15
			Brill. Red 3B Supra Disp.	713.20		Dark Brown 3R Supra Disp.	414.55
			Brill. Purple 4R Conc. Pdr.	470.75		Brown G Acra Conc.	733.95
			Brill. Purple 3R Acra Powder	690.85		Brown R Acra Conc.	766.00
			Brill. Purple 2R Hly Conc.	597.90		Grey M. Powder Fine	768.80
			Brill. Purple 4R Supra Disp.	500.05		Grey M. Supra Disp.	585.45
			Brill. Purple 2R Acra Conc.	625.95		Blue BC Acra Conc. Pdr. Fine	762.70
			Blue R Powder Fine	542.15		Direct Black AC Supra Disp.	330.35
			Blue BC Conc. Pdr. Fine	522.50		Direct Black AC Pdr. Fine	474.70
			Blue BC Acra Conc. Pdr. Fine	762.70		Direct Black CH Supra Disp.	393.20
						Direct ACD Ptg. Paste	217.15

Delhi Market

DELHI: JAN. 29 (NNS) — Hydrogen peroxide jumped up sharply by Rs. 5/7 per kg. in the local chemical market during last week, owing to tight supply of imported and indigenous goods, says NNS. Rangolite prices also went up sharply, while menthol slumped by Rs. 15/28 in the face of improvement in arrivals. Turnover was better.

Hydrogen peroxide went up sharply by Rs. 5/7 at Rs. 33/35 on account of restricted supply of imported and indigenous goods in comparison with consumption. Sellers were anxious buyers.

In the absence of fresh import from Germany, rangolite Germany rose sharply from Rs. 65 to Rs. 83. Chatkolight hardened by Rs. 2.50 at Rs. 45 per kg. on poor import prospects from China along with good seasonal consumption. Hydro Kalali firmed up by 50 paise on good offtake. Tamil Nadu and Damosha hydro ruled static at Rs. 32 and Rs. 34.

Hexamine jumped up by Rs. 2 at Rs. 28 due to increased prices of raw

material and heavy demand shown by consumers. Soda bicarb NAL advanced by Rs. 5 owing to sustained offtake and poor arrivals. Soda bicarb Tata ruled static at Rs. 250.

Menthol bold medium and flakes slumped sharply by Rs. 15/18 at Rs. 220, Rs. 215 and Rs. 202 per kg. respectively in the face of pressure of arrivals from U.P. and lack demand by stockists. Mentha oil nosedived from Rs. 172 to Rs. 160. DMO also ruled easy at Rs. 70 per kg.

Titanium dioxide Anatase and RC-822 eased by Re. 1 each at Rs. 55 and 72 per kg. due to increased arrivals from Kerala. Formaldehyde softened by 50 paise at Rs. 28.50 in the absence of enquiries, while mercury ruled static at Rs. 9,300 per flask. Citric acid sold higher at Rs. 2,300/2,500 followed by bullish advices from Bombay.

Most of the dyes and colours ruled quiet at their previous levels in the absence of demand by local and upcountry speculators.

(DELHI MARKET RATES AS ON JANUARY 29, 1988)

Ammonia Bicarb (per 25 kg)	128.00	Boric acid Technical (per 50 kg)	1000.00
Mercury (per flask)	9,200.00	Paraffin wax (per 50 kg.)	600.00
Soda ash (per bag)	255-285.00	Tartaric acid (per 50 kg)	7,250.00
Ammonium Chloride (per 50 kg.)	110-180.00	Borax Granular (per 50 kg)	580.00
Caustic soda solid (per 50 kg)	385.00	Borax Crystal (per 50 kg)	600.00
Caustic soda flakes (per 50 kg)	375-380.00	Sodium Nitrite (per 50 kg)	650.00
Citric acid (per 50 kg)	2,300-2,500.00	Sodium Nitrate (per 50 kg)	380.00
Stable Bleaching Powder Shriram (per 25 kg)	96.00	Camphor Powder (per kg)	87.00
Stable Bleaching Powder KCI (per 25 kg)	89.00	Camphor Thal (per kg)	95.00
Stable Bleaching Powder MODI (per 25 kg)	92.00	Menthol Medium (per kg)	215.00
Sod. Bicarbonate (per 50 kg)	250-255.00	Menthol Flake (per kg)	202.00
Sod. Hydro Sulphite (per kg)	32-36.00	Menthol Bold (par kg)	220.00
Rangolite (per kg)	45-83.00	Glycerine (per kg)	45-55.00
		Sodium Silicate (per quintal)	250.00
		Hexamine (per kg)	28.00
		Acetic Acid Glacial (per kg)	14.50-18.00

Copper Sulphate (per quintal)	1800-2100.00
Formic acid (per kg)	28.50
Formaldehyde (per kg)	6.50
Hydrogen Peroxide (per kg)	33-35.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	25.00
Acid Slurry Hard (per kg)	32.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1025-1125.00
Tri-Sod. Phosphate (per 50 kg)	325-330.00
Titanium Dioxide Anatase (per kg.)	55.00
Titanium RC-822 (per kg)	72.00
Zinc Oxide (per mt)	34000-38000.00
Phenol Carbohic Acid (per kg)	42.00
Carbon Tetrachloride (per kg)	16.50
Chloroform (per kg)	26.00
Sodium Sulphate (per 50 kg)	160-165.00
Naphthalene Balls (per 50 kg)	1200.00

DYES & COLOUR per kg.

Naphthol AS	150.00
Naphthol ASG	235.00
Naphthol ASBS	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00

DIRECT DYES (perkg)

Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.15
Basic Auramine 'O' Conc.	55-100.00
Basic Rhodamine B.500%	220-300.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00
Acid Orange	45-52.00

Madras Market

Prices in chemicals remained sticky around the previous levels during the week under review. Transactions showed very dull conditions due to bad money market position. No fresh commitments were taken by dealers. The volume of transaction noted was very poor.

Though dull conditions prevailed in the market Borax Granular was in demand at Rs. 625 and Copper Sulphate Ram at Rs. 950; Caustic Soda Fla-

kes Andhra, Mettur and D.C.M. remained firm around the previous rates. All other items remained steady around the previous rates.

In the Madras stock market chemical shares noted were very dull. SPIC noted speculative interest at Rs. 31.50 before it closed at Rs. 32.25; E.I.D. Parry noted profit taking at Rs. 34; Oswal Agro group met with subdued tendency.

(MADRAS MARKET RATES AS ON FEBRUARY 2, 1988)

Aluminium Sulphate (per tonne)	1,700.00
Acetic Acid Glacial (per kg)	16.00
Ammonium Acetate (per kg)	18.00
Ammonium Bicarbonate (per 25 kg)	138.00
Ammonium Chloride Ind. (per tonne)	1,900.00
Ammonium Chloride SPIC (per tonne)	1,700.00
Bleaching Powder (per 25 kg)	100.00
Borax Granular (per 50 kg)	625.00
Carbolic Acid (per kg)	18.00
Chromic Acid Flakes (per kg)	26.00
Calcium Chloride DCM (per 50 kg)	255.00
Caustic Soda Flakes Andhra (per tonne)	8,000.00
Caustic Soda Flakes Mettur (per tonne)	8,000.00
Caustic Soda Flakes DCM (per tonne)	8,000.00
Citric Acid Deshi (per 50 kg)	2,100.00
Cobalt Oxide (per kg)	280.00
Copper Sulphate (Ram) (per 50 kg)	950.00

Cresylic Acid (per kg)	42.00
Formic Acid (per kg)	28.00
Formaldehyde (per kg)	7.00
Hydrosulphite of Soda Ind. (per kg)	35.00
Hydrosulphite of Soda Imp. (per kg)	38.00
Hydrogen Peroxide BASF (per kg)	29.00
Magnesium Carbonate Ind. (per kg)	1,800.00
Magnesium Chloride Pure (per kg)	5.00
Oxalic Acid (per 50 kg)	900.00
Manganese Sulphate (Fert.) (per 50 kg)	265.00
Manganese Sulphate (Tech) (per 50 kg)	240.00
Mercury (per 3.45 kg)	9,000.00
Potassium Bichromate (per kg)	19.00
Phosphoric Acid (per kg)	15.00
Stearic Acid (per kg)	18.00
Soda Ash Tata (per 75 kg)	275.00
Soda Ash Birla (per 75 kg)	365.00
Sodium Bichromate (per kg)	19.00

Sodium Bicarbonate Tata (per 50 kg)	165.00
Sodium Bicarbonate (Birla) (per 50 kg)	175.00
Sodium Cyanide eggs (per kg)	49.00
Sodium Nitrate (per 50 kg)	390.00
Sodium Oxide (per kg)	1,050.00
Sodium Cyanide GDR (per kg)	50.00
Sodium Nitrite Bags (per 50 kg)	530.00
Sodium Silicate (per 50 kg)	130.00
Sodium Bisulphite Aswin (per 50 kg)	185.00
Sodium Acetate (per kg)	5.10
Sodium Sulphate Powder (per tonne)	3,288.00
Sodium Sulphate (S) (per tonne)	5,200.00
Toluene (per kg)	14.00
Trisodium Phosphate (per 50 kg)	290.00
Urea ech (per kg)	280.00
Zinc Oxide (per kg)	30.00
Zinc Chloride (per 50 kg)	500.00
Acetone (per kg)	29.00
Benzene (per kg)	16.00
Carbon Tetrachloride (per 100 kg)	1,500.00
Cellosolve (per kg)	48.00
Chloroform (per kg)	25.00
Diacetone Alcohol (per kg)	29.00
Dibutyl Phthalate (per kg)	33.00
Diethylene Glycol (per kg)	28.00
Sorbitol (per kg.)	31.00
Diocetyl Phthalate (per kg)	48.00
Isopropyl Alcohol (per kg)	22.00
Methyl Ethyl Ketone (per kg)	48.00
Nitrobenzene Indian (per kg)	12.00
Trichloroethylene (per kg)	24.00
Triethanolamine (per kg)	42.00
Turpentine Oil (per kg)	7.00
Phenol (per kg)	29.00
Propylene Glycol DCW (per kg)	28.00
Isobutanol (per kg)	20.00
Paraffin Wax (per bag)	700.00
Alkyl Benzene (per kg)	32.00
Pentaerythritol (per kg)	59.00
Glycerine HL (per kg)	48.00
Phthalic Anhydride (per kg)	28.00
Hyflosupercell (per kg)	22.00
Copper Oxide (Ram) (per tonne)	1,500.00
Zinc Chloride Solid (per kg)	11.00
Zinc Sulphate (Ram) (per tonne)	4,500.00

MATERIALS IMPORTED

BOMBAY

(From 3-12-87 to 4-12-87)
(Cost of Imported Item is
CIF Value)

ORANGE OIL: From Switzerland: M. C. Dawar Aromatics P. Ltd., 1,163.8 kgs., Rs. 44,604.

ORTHO CHLORO PHENOL: From Japan: Sunbeam Monochem P. Ltd., 4,000 kgs., Rs. 1,07,762.

PARA-CHLOROPHENYL ISO-CYANATE: From FRG: Chems-pec Chemicals P. Ltd., 3,000 kgs., Rs. 2,78,854.

PARA CRESOL: From USA: Quality Industries, 14,931 kgs., Rs. 5,00,142.

PARA FORMALDEHYDE: From GDR: Universal Polymers, 9,990 kgs., Rs. 50,324; From Spain: Colour-Chem Ltd., 18 m.t., Rs. 1,01,280.

PARA T-BUTYL PHENOL: From Japan: Prabhat Terpene and Synthetics, 10 m.t., Rs. 1,22,673.

PARA XYLENE: From Turkey: Bombay Dyeing & Manufacturing Co. Ltd., 4,880 m.t., Rs. 2,31,70,158.

PENTACHLORO THIOPHENOL: From FRG: Bayer (India) Ltd., 5,415 kgs., Rs. 6,78,219.

N-PENTANE: From FRG: BASF India Ltd., 39,000 kgs., Rs. 6,20,570.

PERCHLOROETHYLENE: From FRG: Nahar Spinning Mills Ltd., 16,850 kgs., Rs. 1,26,626.

PHENOL CRYSTALS: From Japan: Bakelite Hylam Ltd., 1,00,000 kgs., Rs. 13,34,543.

PHOSPHORUS PENTASULPHIDE: From Italy: Khatau Jun-ker Ltd., 64 m.t., Rs. 8,47,306.

From USA: Cynamid India Ltd., 10,080 kgs., Rs. 1,03,424.

POTASSIUM CARBONATE 99.5%: Bharat Chem & Paint Industries, 17.50 m.t., Rs. 1,15,842.

POTASSIUM CARBONATE: From Japan: Manmohan Chemical Industries, 20 m.t., Rs. 1,28,002; Rashtriya Chemicals & Fertilisers, 52.50 m.t., Rs. 3,50,588.

POTASSIUM PERSULPHATE: From FRG: Grauer & Weil (I) Ltd., 100 kgs., Rs. 7,090.

PROPARGYL ALCOHOL: From FRG: Fine Chemical Products, 1,520 kgs., Rs. 1,43,681.

PROPIONIC ACID: From Japan: Calpro, 15,200 kgs., Rs. 1,19,131.

PROPOXUR TECHNICAL: From FRG: Bayer (India) Ltd., 5,000 kgs., Rs. 26,38,878.

N-PROPYLAMINE: From FRG: Suneeta Chemicals, 2,100 kgs., Rs. 68,816.

PROPYLENE OXIDE: From FRG: BASF India Ltd., 3.52 m.t., Rs. 1,26,023.

RESORCINOL: From FRG: Shilpa International, 3,000 kgs., Rs. 1,46,954.

SILICA GEL CATALYST: From USA: Indian Petrochemicals Corporation Ltd., 5.5 m.t., Rs. 19,89,023.

SODIUM BICHROMATE: From UK: Sudarshan Chemical Industries Ltd., 7,800 kgs., Rs. 1,11,010.

SODIUM METHALLYL SULPHONATE: From Japan: Indian Petrochemicals Corporation Ltd., 17,500 kgs., Rs. 7,61,510.

SODIUM NITRITE: From China: Sudarshan Chemical Industries, 20.60 m.t., Rs. 1,05,546.

STYRENE MONOMER: From USA: Colour Chem Ltd., 17.60 m.t., Rs. 3,26,213.

SUCRALFATE: From China: Adibi Sales Corporation, 1,000 kgs., Rs. 1,62,145.

SULPHUR: From Kuwait: The Indian Link Chain Manufacturer, 2,000 m.t., Rs. 30,05,838; From Kuwait: Rama Industrial Chemicals Pvt. Ltd., 2,000 m.t., Rs. 30,15,902.

THIONYL CHLORIDE: From FRG: Vipul Dyes & Chemicals P. Ltd., 33,600 kgs., Rs. 1,68,070.

TITANIUM DIOXIDE RUTILE: From France: UK Paint Industries, 80 m.t., Rs. 23,30,092.

TITANIUM DIOXIDE RUTILE: From UK: Shreenath Dye Chem Industries, 20 m.t., Rs. 5,16,328.

TRICHLORO ISOCYANURIC ACID: From Spain: Ion Exchange Ltd., 0.90 m.t., Rs. 30,839.

TRIETHYL PHOSPHITE: From FRG: Colour Chem Ltd., 5,060 kgs., Rs. 2,07,266.

3,4,5-TRIMETHOXY BENZ-ALDEHYDE: From China: Med Concepta Laboratories, 640 kgs., Rs. 1,58,022.

2,3,6-TRIMETHYL PHENOL: From FRG: E. Merck (I) Ltd., 2,470 kgs., Rs. 2,21,808.

TRIMETHYL PHOSPHITE: From USA: Sudarshan Chemical Industries, 16,112 kgs., Rs. 4,56,162.

TRI-N-BUTYLAMINE: From FRG: Spectrochem P. Ltd., 450 kgs., Rs. 14,888.

VANILLIN: From USA: Arora Chemicals, 1,020 kgs., Rs. 1,76,902.

VINYL ESTER OF VERSATIC ACID: From Netherlands: Vam Organic Chemicals, 28,548 kgs., Rs. 5,66,927; From USA: Bharat Pulverising Mills P. Ltd., 28.55 m.t., Rs. 5,66,927.

MADRAS

(From 6-1-88 to 19-1-88)
(Cost of Imported Item is
CIF Value)

ACETIC ANHYDRIDE: From Japan: Triton Laboratories P. Ltd., 1.60 m.t., Rs. 21,347.

ALDEHYDE: From Japan: Sri Amar Trading Co., 242 kgs., Rs. 57,007.

ANISALDEHYDE: From FRG: B. V. Aswathiah & Bros., 50 kgs., Rs. 9,442.

AROMATIC CHEMICALS: From France: N. Rangarao & Sons, 2,400 kgs., Rs. 4,20,137; From UK: Reliable Industrial Syndicate, 250 kgs., Rs. 55,865; From Switzerland: Karnataka Soaps and Detergents, 125 kgs., Rs. 2,00,451; From Japan: Reliable Industrial Syndicate, 500 kgs., Rs. 72,310; Mysore Agarbatti Co., 1,000 kgs., Rs. 1,41,979; From Switzerland: Karnataka Soaps & Detergents, 760 kgs., Rs. 1,98,666; Bush Boake Allen (I) Ltd., Rs. 2,75,446; From Hong Kong: Bush Boake Allen (I) Ltd., Rs. 81,701; From Japan: N. Rangarao & Sons, 540 kgs., Rs. 1,49,075.

P-T-BUTYL BENZOIC ACID: From Japan: Addisons Paints & Chemicals Ltd., 3,000 kgs., Rs. 1,28,099.

TERTIARY BUTYL AMINE: From Belgium: New Land Labs. Ltd., 540 kgs., Rs. 32,964.

P-T-BUTYL CYCLO HEXYL AMINE: From Japan: Ranga Rao & Sons, 1,080 kgs., Rs. 59,131.

CAPROLACTAM: From Netherlands: Shriram Fibres Ltd., 187 m.t., Rs. 45,83,659.

CARBOTURAN: From USA: Rallis India Ltd., 9 m.t., Rs. 14,69,526; 9 m.t., Rs. 14,69,526.

CHEMICALS FOR LEATHER FINISHING: From Switzerland: Sandoz (I) Ltd., 20 kgs., Rs. 584.

2-CHLOROPROPIONIC ACID: From Japan: Vijayalakshmi Drug & Chemicals, 8.75 m.t., Rs. 2,16,014.

COLLOIDAL SILICA: From Belgium: Citadel Fine Pharmaceuticals, 300 kgs., Rs. 63,442.

DALAPAN 85 WP: From FRG: Urethanes India Ltd., 200 kgs., Rs. 6,570.

DESMODUR: From FRG: D. P. Forum P. Ltd., 5,500 kgs., Rs. 1,53,359.

DIMETHYL CARBONATE: From FRG: IEL Ltd., 2,800 kgs., Rs. 92,474.

DIMETHYL LAURYLAMINE: From Japan: IEL Ltd., 2,720 kgs., Rs. 98,773.

DIMETHYL TETRADECYLAMINE: From Japan: IEL Ltd., 10,080 kgs., Rs. 3,66,038.

DIPROPYLENE GLYCOL: From FRG: Vinaram, 210 kgs., Rs. 7,065.

ETHYLENE GLYCOL: From FRG: Electronics Corporation of Tamilnadu, 1,760 kgs., Rs. 3,21,191.

ETHYLENE GLYCOL: From FRG: Keltron Component Complex, 4,840 kgs., Rs. 92,969; Elcot Ltd., 880 kgs., Rs. 18,699.

FURFURAL: From Belgium: Coramandal Protonite Ltd., 6,000 kgs., Rs. 1,34,892.

FUSED ALUMINA ABRASIVE GRADE: From USA: Carborundum Universal Ltd., 8,981 kgs., Rs. 3,61,655.

GUM ROSIN N GRADE: From Indonesia: Telangana Paper Mills Ltd., 18 m.t., Rs. 1,27,102.

HEXYL CINNAMIC ALDEHYDE: From Japan: Ranga Rao & Sons, 570 kgs., Rs. 37,690.

HYDROSULPHITE CONCENTRATES: From FRG: Allchemie Raman Smrutti, 10,000 kgs., Rs. 1,10,238.

2-HYDROXY ETHYL METHACRYLATE: From Japan: Addi-

sons Paints & Chemicals Ltd., 1,200 kgs., Rs. 49,674.

p-HYDROXYL PHENYL ACETAMIDE: From Japan: Menidian Pharmaceuticals P. Ltd., 120 kgs., Rs. 80,901.

IODINE: From Switzerland: Madras University, 0.50 kgs., Rs. 1,162.

IODINE CRUDE: From Japan: Eskeyef Ltd., 3,000 kgs., Rs. 7,18,062.

ISO BERNYLOXANATE: From France: Sri Vijayalakshmi Agarbatti Works, 187 kgs., Rs. 13,479.

ISO CAMPHYL CYCLOHEXANOL: From Sri Lanka: Bharat Industrial Corporation, 1,000 kgs., Rs. 1,35,428.

LEMON OIL: From UK: Robin Chemicals P. Ltd., 300 litres, Rs. 42,992; 400 litres, Rs. 60,918.

LIME OIL: From UK: Robin Chemicals P. Ltd., 150 litres, Rs. 58,363; 200 litres Rs. 82,668.

LINALOOL LINALYL ACETATE: From USA: Bharat Industrial Corporation, 539 kgs., Rs. 47,833.

LYSINE MONOHYDROCHLORIDE FEED GRADE: From Korea: Mysore Feeds P. Ltd., 3,000 kgs., Rs. 5,81,704.

METHYL ACETO ACETATE: From USA: Shasun Drugs, 34,036 kgs., Rs. 1,10,886.

MANCOZEB 80 WP: From FRG: Urethanes India Ltd., 200 kgs., Rs. 6,570.

2-MERCAPTO BENZIMIDAZOLE: From Japan: Shriram Fibres Ltd., 1,750 kgs., Rs. 2,47,695.

METHYL ISO THIOCYANATE: From FRG: Standard Research Centre, 10 kgs., Rs. 13,135.

NEOPENTYL GLYCOL: From Japan: Vijayalakshmi Drugs & Chemicals, 7 m.t., Rs. 1,36,175.

NICKEL SULPHATE: From UK: Wheels India Ltd., Rs. 83,242 Rs. 83,242.

ORGANO TIN COMPOUNDS:

From UK: Polymate Foams Pvt. Ltd., 3 kgs., Rs. 200.

OXALIC ACID: From Korea:

OCS, Madras, 1 kg., Rs. 225.

PATCHOULI OIL: From Indo-

nesia: Ranga Rao & Sons, 400 kgs., Rs. 1,19,022.

PHOSPHORIC ACID: From

USA: Madras Fertilizers Ltd., 5,630 m.t., Rs. 2,60,78,418.

POLYVINYL ACETATE 'EMUL-

SION: From UK: Madura Coats Ltd., 10 kgs., Rs. 500.

POLYVINYL ALCOHOL: From

Japan: Pasupathy Polymers, 1,000 kgs., Rs. 20,751.

PYROLIGENOUS ACID: From

UK: Bush Boake Allen (I) Ltd., 1,000 kgs., Rs. 12,412.

SILICON CARBIDE: From Nor-

way: Carborundum Universal Ltd., 21,000 kgs., Rs. 4,62,501.

SOLVENT: From Japan: Elec-

tronic Research Ltd., 56 kgs., Rs. 2,660; 64 kgs., Rs. 2,587; 126 kgs., Rs. 5,219.

TEREPHTHALIC ACID (PURI-

FIED): From Spain: Indian Organic Chemicals, 3,78,000 kgs., Rs. 29,22,714.

TETRA ETHYL LEAD: From

UK: Madras Refineries Ltd., 27,816 kgs., Rs. 13,45,556.

TITANIUM DIOXIDE: From

Belgium: Shriram Fibres Ltd., 500 kgs., Rs. 16,536.

TRIETHYL PHOSPHATE: From

FRG: The Mysore Acetate & Chemicals, 5,940 kgs., Rs. 2,43,047.

TRIMETHOXY BENZALDEHY-

DE: From Netherlands: Inventa Chemicals Pvt. Ltd., 3 m.t., Rs. 8,44,287; Prasad Drugs Pvt. Ltd., 1,250 kgs., Rs. 3,55,839; Inven-

ta Chemicals Pvt. Ltd., 2,000 kgs., Rs. 5,61,257.

TRIMETHYL PHOSPHITE:

From USA: Indian Organic Chemicals, 2,180 kgs., Rs. 82,172.

YLANG OIL: From France:

Karnataka Soaps & Detergents Ltd., 150 kgs., Rs. 30,265.

DRUGS MATERIALS IMPORTED**MADRAS**

(From 6-1-88 to 19-1-88)

(Cost of Imported Item is
CIF Value)

CALCIUM D-PANTOTHENA-
TE: From FRG: Remidex Pharma
P. Ltd., 250 kgs., Rs. 44,633.

L-EPHEDRINE HYDROCHLO-
RIDE BP 80: From FRG: Tamil
Nadu Dadha Pharmaceuticals
Ltd., 100 kgs., Rs. 63,144.

ERYTHROMYCIN THIOCYA-
NATE: From Italy: Sparr Equip-
ments P. Ltd., 299 kgs., Rs.
3,29,582.

GLYCERINE BP: From FRG:
Khoday R.C.A. Industries,
10,000 kgs., Rs. 3,05,217.

HYDROXYLAMINE SULPH-
ATE: From Japan: S. K. S. Drugs
Pvt. Ltd., 17.50 m.t., Rs.
5,14,756; Metro Exports P. Ltd.,
35,000 kgs., Rs. 8,70,924.

L-LYSINE MONOHYDROCH-
LORIDE: From Japan: Sunex
Commercial P. Ltd., 3.05 m.t.,
Rs. 1,14,942.

MANNITOL USP: From Brazil:
Rasiklal & Sons, 4,000 kgs., Rs.
85,696.

OXYCLOZANIDE: From UK:
Imkemex India Ltd., 300 kgs.,
3,52,002.

PHARMACEUTICALS: From
Hungary: Tamil Nadu Dadha
Pharmaceuticals, 118 kgs., Rs.
67,010; From FRG: T. T. K.
Pharma P. Ltd., 10 kgs., Rs.
74,433.

ALPHA-PHENYL GLYCINE:
From Singapore: T. T. K. Chemi-
cals Ltd., 2,000 kgs., Rs. 3,83,
517.

**PLASTICS MATERIALS
IMPORTED****MADRAS**

(From 6.1.88 to 19.1.88)

(Cost of Imported Item is
CIF Value)

CELLULOSE ACETATE RESIN:
From USA: Rajchani Plastics,
16.08 m.t., Rs. 61,664.

EPOXY RESIN: From Japan:
Electronic Research P. Ltd.,
2,340 kgs., Rs. 1,90,179; From
Spain: Suchitra Tubes Ltd., 200
kgs., Rs. 85,572; From FRG: Ko-
thari Electronics P. Ltd., 5,650
kgs., Rs. 3,31,000; From Singa-
pore: Suchitra Electronics P.
Ltd., 3,900 kgs., Rs. 1,80,517;
From Korea: Suchitra Compon-
ents Ltd., 1,296 kgs., Rs. 81,710;
From Japan: Kothari Electronics
& Industries Ltd., 170 kgs., Rs.
23,051.

**ETHYLENE VINYL ACETATE
POLYMER:** From Singapore:
2,000 kgs., Rs. 33,894.

HDPE: From Japan: S. S. La-
minates Pvt. Ltd., 25 m.t., Rs.
2,99,630; From Saudi Arabia:
M/s. B. M. Shah, 17.15 m.t., Rs.
2,05,738.

NONYL RESIN: From Korea:
Suchitra Electronics P. Ltd.,
1,000 kgs., Rs. 58,543.

PHENOLIC RESIN: From UK:
Pec Potentiometers Ltd., 27 kgs.,
Rs. 8,817.

POLYPROPYLENE: From FRG:
MM Rubber Co. Ltd., 400 kgs.,
Rs. 26,478; From Korea: Suchi-
tra Electronics Ltd., 1,000 kgs.,
Rs. 41,129.

POLYPROPYLENE RESIN:
From USA: MM Rubber Co. Ltd.,
30 m.t., Rs. 4,94,122.

POLYPROPYLENE (ATACTIC):
From Japan: Nisho Iwsi Corpora-
tion, 5 kgs., Rs. 100.

FOR YOUR REQUIREMENTS OF:

Di Octyl Phthalate [D.O.P.]
Di Butyl Phthalate [D.B.P.]
Di Butyl Maleate [D.B.M.]

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M.I.B.K.

I.P.A.

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Hexene

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Acetone (Tech.)

Please Contact :

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Phone : 325756/332325, Resi.: 687654

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AMMONIUM CHLORIDE
AMMONIUM MOLYBDATE
ALUMINIUM SULPHATE
AMMONIUM IODIDE
BORAX
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CALCIUM SULPHATE
CALCIUM NITRATE
COBALT SULPHATE
COBALT NITRATE
COPPER SULPHATE
CITRIC ACID
CREAM OF TARTAR
CHOLINE CHLORIDE
CUPROUS IODIDE

DI. SOD. HYD. PHOSPHATE
FERROUS SULPHATE
FERRIC CHLORIDE
GELATIN
HYPO
MAGNESIUM STEARATE
MANGANESE CARBONATE
MANGANESE SULPHATE
MAGNESIUM CHLORIDE
MAGNESIUM OXIDE
MAGNESIUM SULPHATE
MOLYBDIC ACID
NICKEL SULPHATE
OXALIC ACID
POTASSIUM BROMIDE
POTASSIUM NITRATE

POTASSIUM NITRATE
POTASSIUM SULPHATE
POTASSIUM IODIDE
P.T.S.A.
PENTAERYTHRITOL
SODIUM NITRATE
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